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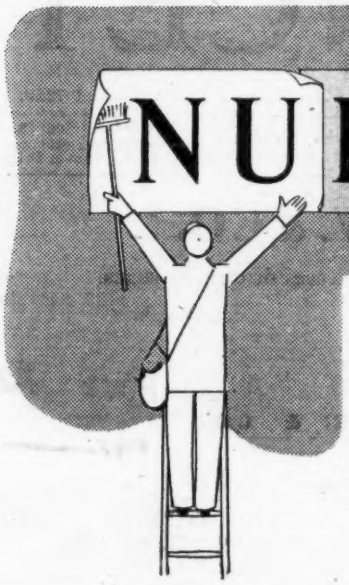

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I. Wilder, R.M., Ann. Int. Med. 14 : 2189, June 1941; J. Am. Dietetic Assoc. 18 ; I. Jan. 1942.

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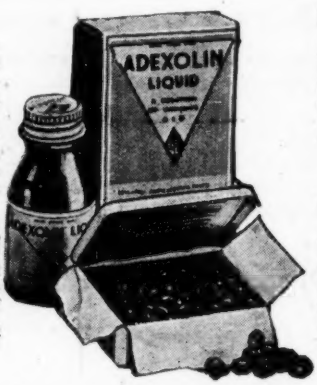

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EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS*

R. R. TRAIL, M C, M D ABERD, F R C P
WING-COMMANDER, RAFVR; PHYSICIAN TO THE ROYAL CHEST HOSPITAL, AND SURGICAL UNIT, PAPWORTH

IN the past ten years more papers have been published on this subject than on any other aspect of chest disease. This implies something deeper than intrinsic interest. It reflects a feeling of uneasiness, even a sense of disappointment, however much this may be camouflaged by a repetition of our difficulties and by a hope that an ever-spreading knowledge of premonitory symptoms and early signs will put an end to our continuing failures. We discuss the early diagnosis of pulmonary tuberculosis, and are still a long way from the diagnosis of early pulmonary tuberculosis, except in a disappointingly small percentage of cases. We have no cause for complacency.

It is true that the last twenty years have seen progress in certain directions. Propaganda directed at the public and the general practitioner has been widened; we have set up better equipped public-health services, and have been urged to greater efforts in diagnosis by noting the encouraging immediate and end-results of modern collapse therapy. On this last point Dr. G. S. Todd of King Edward VII Sanatorium, Midhurst, has kindly supplied the following figures. Among sputum-positive cases, the five-year survival-rate after discharge from the sanatorium averaged 44% before the introduction of collapse therapy in 1925; after that date it rose to 60% until 1935, when it again rose to nearly 70%. Furthermore we have been heartened by the study of graphs of falling national death-rates. Thus, the tuberculosis death-roll for England and Wales in 1938 was 26,178, a fall of 10,456 since 1928—that is, an improvement of 31 per 100,000 of the population in 10 years.

Detailed analysis of the present position in respect of the number of sufferers and the extent of disease at diagnosis is, however, not so pleasant. In that same year of 1938 about 230,000 cases were under observation at the tuberculosis dispensaries of England, Scotland and Wales, while 65,000 new cases were notified, and there were 30,000 deaths from the disease. Moreover it claimed half the total deaths from all causes at ages between 15 and 24, an age-group particularly important in national economy, and the one in which the decline in mortality has continued at a slower rate than in any other. To this we must add that the increase in deaths from all forms of tuberculosis between 1939 and 1940 was 3005, and that returns for the respiratory form in 1941 are 13% above the average for 1938 and 1939. Indeed, if we draw conclusions from experience of the last war, we may expect now a temporary levelling of this comparative increase, and then a sharp rise in both incidence and mortality over the next two years.

What of the results of increased propaganda and improved facilities for dispensary diagnosis? Two comparative sets of figures will enlighten us. In 1927, of adult patients admitted to residential treatment for pulmonary tuberculosis under the London County Council scheme, only 6% were classified as B I at the time of admission; 78·4% were classified as B II or B III. In 1937, that is 10 years later, 5·7% were B I and 80·3% B II or B III. These facts speak for themselves. We cannot claim that any advance has been made by propaganda, and what is much more instructive is the fact that the best possible tuberculosis services with every modern equipment made no improvement towards earlier diagnosis in 10 years.

This depressing story has a still more depressing ending. By the extent of disease at diagnosis the majority of these unfortunates are unsuitable for modern methods of treatment and but few survive for 5 years after discharge from sanatorium treatment. They show a poor economic return and a minimal gain in social happiness for the care and expense afforded them. Thus, patients discharged in 1932 from LCC residential institutions and traced till 1937 give the following survival-rates—for B II cases, 41·2%; for B III cases, 7·9%. When we place against these figures the survival-rate of 81% in B I cases, the necessity for early diagnosis with all its attendant advantages to the individual in efficient treatment and to the national economy in the return of patients to work is self-evident. The after-history of Midhurst patients with stage of disease comparable to B I shows an improvement in the five-year survival-rate from 86% in 1930–32, to 93% in 1933–35.

Is there any cause in the present conditions governing diagnosis that by itself denies us the power to discover disease at an earlier stage? Why do we fail in spite of trained observers and continually improving health services? The answer is not far to seek. For diagnosis, doctor and patient must meet. Up to the present, in civil practice, a doctor must perforce wait until the patient comes to him. It is only with the arrival of symptoms, and not always then, that the patient will seek advice. To ask the general practitioner therefore to diagnose at a stage before the appearance of symptoms for which his advice is eventually sought is to ask the impossible. On the other hand, there are those who still preach that all cases of established phthisis have symptoms. We could wish this were true, but experience has taught us otherwise.

SYMPTOMS AND SIGNS

That the present method of approach is unsatisfactory and must deny us opportunity for the discovery of early disease in all but a small proportion of sufferers does not mean, however, that every case presenting himself is diagnosed when he should be. To found diagnosis only on the discovery of tubercle bacilli in the sputum is to wait for the late sign of ulceration of the lesion into a bronchus, and is just as culpable as to ignore the presence of nummular sputum or gross clubbing of the fingers. To delay until added sounds are heard above the collar-bone is to diagnose only when at least a third of the lung is already involved. There are undoubted warnings in past and present histories of patients which nature gives and many doctors either ignore or fail to investigate. A study of the past histories of 2000 patients of Midhurst Sanatorium with positive sputum disclosed that 26·6% had an untreated or inefficiently treated haemoptysis or pleurisy some 3 or 4 years before admission. This does not imply that these two conditions are always indicative of tuberculosis, but it does prove that large numbers of young adults do not have the expert and eliminating examination which such conditions should demand. Among similar warnings too often ignored are: cough of more than a month's duration; persistent indigestion; nausea or actual sickness with meals, especially breakfast; an unnatural lassitude, often accompanied by uncomfortable face-flushes in the late afternoon; fistula-in-ano; amenorrhœa, and erythema nodosum. There is no doubt that if patients with such complaints were referred immediately for complete chest examination and periodic review many more would be diagnosed in the earlier stages of the disease.

To many doctors physical signs in the chest have come to mean only the presence of added sounds. By its pathology the lesion cannot give added sounds until the caseous contents of infected acini break down and discharge into their accompanying bronchioles, by which time fibrosis and plastic pleurisy are developing and the patient may already be past the best stage for the simpler methods of collapse-therapy. Long before this occurs, the usual initial silent area of bronchopneumonia gives two definite physical signs in lack of movement and evidence of mediastinal shift. It imposes on the side of the disease a loss of movement far beyond its extent, so that the base lags behind that of the opposite side when the actual area of deposit is but a single subclavicular focus. Again, phthisis is the chronic chest disease par excellence to produce the sign of mediastinal displacement from its earliest appearance. While the stethoscopic signs of fibrosis and the X-ray findings of tracheal and mediastinal shift are still absent, the patient with a unilateral and early lesion shows a diagnostic tension of the origin of the sternomastoid at the inner end of the clavicle on the same side of the chest, and thus warns the physician of the presence of an abnormality that requires the strictest investigation.

When added sounds do appear, they are for a considerable time slight in extent, and found only in the early hours of the day; their causative mucus is coughed up or

* The Varrier-Jones Memorial lecture, delivered before the Halton Medical Society on Sept. 25, 1942.

absorbed hours before the usual evening consulting hour. If their presence is suspected they are to be sought before the patient gets up in the morning. In their actual quality they are bronchitic, in fine sibili and occasional rhonchi. They have, however, two diagnostic characters which differentiate them from the sounds of simple bronchitis and thus should obviate the lesser diagnosis at a critical stage of the patient's illness. First, they are unilateral and seldom heard at the base; secondly, they are, as no other such sounds in the chest, made more and more insistent with the depth of inspiration until they reach a crescendo at its very end. They are therefore totally opposed to the sounds of simple acute bronchitis, which are always most evident in the first half of inspiration.

Unfortunately, as we shall see upheld by the results of X-ray examination, the disease has progressed to a later stage in almost every case before it reaches expert physical examination. The usual type of lesion has already signs of fibrosis and pleural thickening, and many are already showing the signs of cavitation. To the stethoscope, fibrosis reveals itself in fine to coarse crepitations which have a dry quality to the ear, and are heard throughout the whole phase of inspiration. They do not disappear with cough as the bronchitic sounds usually do, because they are evidence of an increase of interstitial tissue. Signs of pleural thickening can often be heard in a burst of fine crepitations which accompanies the act of coughing. When cavitation is present, the stethoscope usually produces a more reliable sign of its presence than can be discovered by listening for whispering pectoriloquy; coarse metallic added sounds are heard in the last half of inspiration, reaching a crescendo at the end, and remaining after cough. They can be heard in many cases where whispering pectoriloquy is absent because the cavity is full or almost full of tuberculous exudate.

OTHER AIDS TO DIAGNOSIS

Estimation of the sedimentation-rate of the red blood-cells may aid the diagnosis. A fall beyond 10% in the micro-method or 8 in the Westergren method is suspicious, and ought to be considered in the summation of a doubtful case. It is not, however, diagnostic; the cause may be some intercurernt condition, worry or psychological upset. On the other hand many proved active cases with positive sputum show a fall within accepted normal limits.

Sometimes an exercise-test on pulse and temperature will help. The case of active disease will often fail to return a pulse-rate below 90 in five minutes, or a normal rectal temperature of 99° F. in half an hour after a brisk walk for 20 minutes.

The next step in investigation is X-ray examination. The last 25 years have seen such great advances in equipment and technical procedure that nowadays a clear picture can be produced, while the correlation of pathological processes and their physical signs with corresponding shadows on the film has made interpretation more and more exact to the trained observer. But screening and film examination are best carried out by a radiologist with experience of chest examination, a chest physician, or a tuberculosis officer.

Lagging of the diaphragm and loss of translucency on the affected side are early findings in screening. On the film, the first variation from normal lung shadows takes one of two main forms in the early stages of disease, according to the type of lesion. This may be proliferative and fibrocaseous, or acute and exudative. The former is by far the commoner in young adult tuberculosis, and usually presents a rounded area of loss of translucency in the inner or outer third of the subclavicular region on one side of the chest. It is known as the "Assmann's focus." The loss of translucency is fairly even, though it tends to be densest in the centre. To close inspection its edges disappear gradually into normal lung shadows, but viewing at a distance throws it into strong contrast to surrounding bronchial and vascular markings. In many cases it has already broken down to cavity formation by the time of its discovery, when it shows as a well-defined annular shadow, often with a fluid level.

The average early case has, however, progressed beyond the true Assmann's focus in another fashion; it has lost its rounded formation and is confused and irregular in outline, its edges, which denote advancing infiltration, merging into the shadows of consequent increased blood-supply, while its lower zone appears to be drawn out to join the increasing markings of draining bronchi that track towards the upper hilar region. The background has a generalised fine loss of translucency, which is the X-ray evidence of progressive plastic pleurisy. In this background, thrown into relief by distant viewing, can be seen several small scattered areas of heavier loss of translucency. These are bunches of acini, organised or collapsed, and beginning to fuse. They are evidence of the fibrotic character of the disease, acini that have already emptied their granulation tissue into accompanying bronchioles showing collapse, while others, unable to rid themselves of their exudate, are proceeding to caseation and organisation.

Experience with mass radiography, by the opportunity it gives of studying large numbers of films, shows that there is a type of proliferative upper-zone disease that is much commoner than was formerly believed—true apical tuberculosis. Here a lesion with the characteristics just described is found above the clavicle; only seldom is there present a true rounded area comparable with an Assmann's focus, although a suggestion of its previous presence can often be noted.

Acute, non-fibrous, exudative phthisis is fortunately a much rarer finding. Its X-ray shadows are in their ultimate characteristics not unlike those of bronchopneumonia. They are alike in that they are bilateral, but where the cause is tuberculosis, they have edges which are more woolly, and they have between them areas of much more defined translucency. Moreover, they are smaller, far more numerous, and tend to be confined to, or more marked in the upper and mid-zones of the lung fields as against the predominantly lower zone shadows of simple bronchopneumonia, which always tend to follow the lines of the bronchial tree. They are the evidence of inflammatory exudate filling the acini and caseating and disintegrating freely, because it is uncontrolled by the fibrous tissue and giant cells of the proliferative form of the disease. This exudate fills the bronchi to produce the stethoscopic finding of coarse rhonchi and finer sibili of true tuberculous bronchitis, and it rapidly infects the lymph-nodes so that the hilar shadows become enlarged, matted and indistinct.

MASS RADIOGRAPHY

Even from such a short description of the changes produced on an X-ray film by the earlier pathological developments of a tuberculous lung lesion, it is clear that we have in X-ray examination something quite definite to the expert eye, something which, even at its lowest valuation, is a visual indication of abnormality, calling for immediate and strict investigation. In other words we have to hand a method of approach to diagnosis which can reverse the present one. The doctor can seek out the patient. He need not wait until the patient seeks him, driven by symptoms too often ignored until of long standing, and too often capable of other interpretations. Moreover, as we shall presently see, these symptoms are too often delayed in their appearance until the disease is far past its early stages. The proof for such a statement lies in the experience of the routine examination of certain selected groups of supposedly healthy subjects, which has been called mass radiography. This was in its earliest experiments on smaller scales carried out as ordinary direct radiography of the chest by full-sized X-ray photographs; now it is possible to use apparatus suited to indirect or miniature radiography, whereby there is produced on a small film a reduced camera photograph of the full-size image on the fluorescent screen. As against ordinary X-ray examination, it is much less costly, and it is so much faster that we can examine about seven times as many patients per day. The type of apparatus using 35 mm. cine-camera film is commonest in this country.

A considerable amount of experience has been gained over the past five years from series of examinations made by direct radiography and fluoroscopy. For example, large numbers have been covered among applicants for employment in the Mitcham Radio Works, the Brazil Fruit Trade and the Metropolitan Insurance Company of New York. More recently there has been a large extension of the use of miniature radiography. Recruits to

the Royal Navy, the Army, the Royal Air Force, the Canadian and United States Armies and the Australian Imperial Forces are passing through a scheme of mass radiography in increasing numbers.

FINDINGS IN THE ROYAL AIR FORCE

Some of the results obtained in RAF and WAAF personnel (see table) will give an idea of what can be expected in examinations of the civil population. Before considering them, it is well to note two special points. First, all personnel in the series quoted had been through routine medical examination preceding mass radiography, in that all had been examined by National Service Boards some 6–12 months previously; in addition, all the men had had a stricter medical examination within the previous 6 months with a view to selection for special duties. Those recruits therefore with declared symptoms or with physical signs found by previous examiners had already been weeded out before the remainder, the supposedly healthy, attended the Chest Radiography Sections where mass examinations are carried out. Secondly, while, as already pointed out, the expert eye may be able to diagnose any form of chest disease by film examination only, the opportunities for error by individual opinion are so great and the implications to the suspect so serious that final diagnosis does not rest on X-ray interpretation alone. The small film can show a variation from the normal, and when it is projected to a size about 8 in. × 6 in., areas of abnormality are thrown into strong contrast with surrounding normal lung markings. There the miniature film reaches its limit of usefulness—it can weed the abnormal from the normal. For ultimate diagnosis, a large film, with its possibilities of greater detail, and full clinical and pathological examination are necessary in every case where an abnormality is noted. Such exhaustive investigation has been carried out, with bed-observation where indicated, and no case has been considered tuberculous where there is any reasonable doubt of the diagnosis as judged by accepted modern criteria.

The men in this series were X rayed by the Solus four-valve transformer set, exciting a rotating anode 'Dynamax' tube as described in a previous paper (*Lancet*, 1942, i, 609). The officer in charge is Flight Lieutenant L. G. Scott. Of the 65 men (0·22%) considered to have active tuberculosis records show that 53 (82%) had physical signs to expert examination but 56 (86%) denied on close questioning the presence of any complaint which might be connected with their condition. Of the remaining 9 the majority had usually cough, sometimes with sputum, which had been present for a few weeks only, and was considered by them to be due to a recent cold, to smoking, or to what they called "the usual morning cough which everybody has."

The women are from one unit under the charge of Flight-Lieutenant Clive. The X-ray machine is of the Westinghouse condenser-discharge type, exciting a 'Machlett' stationary-anode tube.

The numbers in both series are sufficient foundation for conclusions up to the age-group 25–29. The incidence of active disease is about 1 per 1000 more for women than for men at the age-group 20–24 (0·35% for men and 0·44% for women), but the incidence for women under 20 is more than double that for men (0·39% against 0·16%). Similarly among inactive cases, the incidence of disease in women under 20 is four times as great as among men, and one and a half times as great in the age-group 20–24, while the percentages approximate to equal in the age-group 25–29. The figures also show that among the supposedly healthy adolescent and young adult population between 18 and 24 there are some 3 per 1000 who have unsuspected active tuberculosis, and that more than 1 per 2000 is a potential source of infection, as he has, unknown to himself, a positive sputum. The number of the population in these age-groups by the last census, corrected according to birth-rates at the end of the last war is, for England, Scotland and Wales together, some 5,000,000. The implication is obvious. There are in these age-groups some 15,000 who have unsuspected tuberculosis; all of them require at least expert supervision and advice, and many need treatment for a period that can be determined only by close observation.

The table gives the stage of disease found in cases considered active. These cannot be strictly compared with Ministry of Health classifications in which symptoms and the presence or absence of positive sputum are considered; as already pointed out they refer to patients without admitted symptoms. The classification is by extent of lung involvement only, as shown by films. Nevertheless, it is a legitimate conclusion that some 25% more cases are found in the early stage of disease by mass radiography than by the present civilian methods of diagnosis. Moreover it can be claimed that had the examination taken place earlier in the lives of those already in a moderately advanced stage, these figures would be better still. Furthermore, all of them have a good chance of recovery in that their resistance is not yet broken; they are not yet ill with the disease.

THE FUTURE

There is no proof that of those now passed as normal many will not break down in the future, immediate or more remote. Periodic examination is a necessity. Of the normals some are undoubtedly non-immune, and therefore not only particularly liable to infection but also especially dangerous to their fellows once they fall victims to the disease. Their protection would be much increased if it were possible to extend examination to those already in the communities they are about to join; in other words mass radiography of the already employed as well as of those about to enter employment would confer a double benefit on the nation—a benefit to the individuals discovered, and a benefit to those they are liable to infect.

Before embarking on any extension of mass radiography for the nation much preparatory work will be necessary. To the mind of the adult worker X-ray examination is associated with disease, and disease with economic disaster. It will be hard, until he can see results for himself, to impress on him the benefits of early diagnosis. Legislation will have to come whereby he need no longer fear victimisation, the loss of his employment and the bogy of permanently reduced standards of life for himself and his family. Present circumstances work against both the patient and the tuberculosis services; they hinder immediate treatment by worry and they militate against good end-results by

NUMBERS SHOWING X-RAY EVIDENCE OF PULMONARY TUBERCULOSIS

MALES

Age (yr.)	Under 20	20–24	25–29	30–34	35 and over	Totals
Examined ..	13,431	10,795	3987	1830	85	30,130
Active ..	22 (0·16%)	38 (0·35%)	3 (0·08%)	2 (0·11%)	0	65* (0·22%)
Inactive ..	12 (0·09%)	39 (0·36%)	36 (0·9%)	20 (1·09%)	1 (1·17%)	108 (0·36%)
Total positive	34 (0·25%)	77 (0·71%)	39 (0·98%)	22 (1·20%)	1 (1·17%)	173 (0·58%)

FEMALES

Examined ..	5404	2498	1096	359	182	9989
Active ..	21 (0·39%)	13 (0·44%)	2 (0·18%)	1 (0·28%)	1 (0·55%)	38* (0·38%)
Inactive ..	16 (0·38%)	18 (0·6%)	14 (1·28%)	2 (0·55%)	6 (3·3%)	56 (0·56%)
Total positive	37 (0·71%)	31 (1·04%)	16 (1·46%)	3 (0·83%)	7 (3·85%)	94 (0·94%)

* Of the cases considered active, sputum was positive in 17 males (26%) and 4 females (10·5%).

Stages by extent of lung involvement radiographically: Stage 1, males 35 (54%), females 18 (47%); stage 2, males 21 (33%), females 18 (47%); stage 3, males 9 (13%), females 2 (6%).

Tuberculous pleural effusion noted in 4 males and 1 female; old tuberculous pleurisy in 3 males.

Calcified nodules, calcified glands or both seen in 275 males (0·93%) and 124 females (1·2%).

Total number showing evidence of tuberculous infection: males, 173 + 275 + 7 = 445 (1·51%); females, 94 + 124 + 1 = 219 (2·2%).

In addition, 13 males and 10 females are under observation; of these, 4 males and 5 females are under 20 and 5 males and 3 females between 20 and 24.

compelling the quiescent case to return to employment before he has attained arrest of his lesion. They are an undoubted factor towards the gloomy after-histories of sanatorium-treated patients.

Immediate hopes for the future control and treatment of pulmonary tuberculosis must be based on periodic mass radiography of the adolescent population; anything less comprehensive will fall short of the lessons indicated by the experience here analysed. If we began now on a scheme of examination at school-leaving age and followed by annual review to the age of 30, we would cover those age-groups on which morbidity and mortality fall most heavily. Initial cost would shortly be offset by the saving of vast sums of money now spent on hospital treatment of advanced cases; this money gives a disappointingly poor return in social happiness and nine-tenths of it is a loss to national economy. Indeed, we must soon not only solve the problem of the early diagnosis of pulmonary tuberculosis but be ready to act on a diagnosis of early pulmonary tuberculosis.

I am indebted to Squadron-Leader H. J. Trenchard for his help in preparing the tables.

PROFLAVINE POWDER IN WOUND THERAPY

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DURING the present war chemotherapy has been extensively used for the treatment of the wounded and appears to have been effective in reducing the incidence of infections, especially those due to hæmolytic streptococci, which were very common in the Great War but are less common in this one. There has been an improvement even between two phases of the present campaign. In the first Libyan offensive (winter 1940–41) the sulphanilamide drugs were employed only sporadically on the L of C, usually in completely inadequate dosage, and on admission to base hospitals the wounds were often infected with hæmolytic streptococci. Thus out of 14 cases admitted to one ward from one convoy in January, 1941, 8 were infected with this organism. In the second Libyan campaign (winter 1941–42) sulphonamides were given by mouth and used locally in almost every suitable case and the doses were more adequate and regular. As a result the incidence of streptococcal wound infections diminished, while other infections less amenable to chemotherapy, such as those due to staphylococci, *Bacillus proteus*, *B. pyocyaneus*, &c., became relatively more common. But there are still some wounded men who, either in spite of chemotherapy or more probably owing to its inadequate application, arrive at the base with their wounds in a grossly infected and purulent condition. In these cases the sulphanilamide drugs can do no more than prevent the spread of infection and they have comparatively little influence on the course of the local suppuration. Such wounds are commonly deep or extensive, often involve bones or joints, mixed infections are almost the rule, and they have sometimes proved extremely slow to heal.

These intractable wounds are a distinct problem in any hospital where large numbers of seriously wounded men are treated, and they are especially difficult in orthopædic centres where many of the worst cases are concentrated. In one of these centres it was decided to try proflavine powder in their treatment, because certain experimental work to be quoted later had shown that this substance was relatively non-toxic and had a strong bactericidal effect on a great variety of organisms. The first case in which the antiseptic was used was dangerously ill and the results were dramatic. They have not yet been quite equalled in any other case, but since then proflavine powder has been used in 80 cases of all grades of severity and the results are sufficiently encouraging to warrant description. The cases described below may be regarded as fairly typical of what may be expected from the use of proflavine. The preparation used throughout was 2:8-diaminoacridine sulphate (BDH).

CASE-RECORDS

CASE 1.—A corporal, aged 28, was wounded by a shell burst on Dec. 8, 1941. On admission 7 days after wounding his condition was poor and his arm, which was fixed in an abduction plaster, was uncomfortable. Next day, under general anæsthesia, the plaster was removed, revealing a large infected wound about 6½ in. × 4 in. occupying most of the left deltoid area. Through this wound a large shell fragment had passed, shattering the upper end of the humeral shaft, and coming to rest in the axilla below the main neurovascular bundle. Several loose bone fragments and metal splinters were removed and the wound was dressed with powdered sulphanilamide (10 grammes), covered with 'Vaseline' gauze, and the arm refixed in a plaster abduction spica. Culture of the pus gave non-hæmolytic streptococci, diphtheroids and *B. proteus*, so the patient was given sulphanilamide by mouth (48 g. spread over 7 days). During this postoperative period his condition improved for about 10 days and then his temperature began to fluctuate between 101° and 103·4° F. and pulse-rate between 100 and 120 per min., while he began to complain of much pain in the shoulder.

On Dec. 30 (15 days after admission), under 'Pentothal' anæsthesia, the plaster was removed and an abscess was seen pointing below the left clavicle. It was opened by one incision beneath the clavicle and a counter-incision near the posterior axillary fold; a shell fragment measuring 2 in. × 1 in. was removed from the axilla. Culture of the pus gave non-hæmolytic streptococci, *Staphylococcus albus* and *B. proteus*. Sulphanilamide, 10 g., was introduced into the abscess cavity and the arm refixed in an abduction plaster. After operation 3 pints of blood was given by drip transfusion, and also 30 g. sulphathiazole spread over 4 days.

Again he improved, this time for about 3 weeks, and then his temperature began to swing up to 103° F. and his pulse was consistently over 100 per min. On Jan. 26, 1942, another 3 pints of blood and 2 pints of glucose saline were given by drip transfusion, the plaster spica being removed and the arm merely fixed in a sling. At this period his general condition was low, his appetite was poor, he was very thin, and he sweated profusely. As the closed plaster technique had failed to produce good results, it was decided to change over to regular dressings, and all the usual drugs were tried in succession—eusol, 1/1000 acriflavine, hydrogen peroxide, sulphanilamide, and hypertonic sodium sulphate. Despite everything his condition deteriorated and the discharge was profuse, coming mainly from the infraclavicular wound, which now resembled a small tea-cup in size and shape (2½ in. diameter × 2½ in. deep).

On Feb. 15, 2 g. of proflavine powder was introduced through the left infraclavicular wound into the axilla. The result was dramatic, the discharge drying up completely in 3–4 days and the general condition showing great improvement. By Feb. 28 the wound below the clavicle was healed, an astonishing occurrence for a wound of its size and chronicity. A week later the incision near the posterior axillary fold was also healed. The wound in the deltoid region also diminished in size (though less rapidly), and now (April 27) it is almost dry and is covered by a thick scab. Culture from this wound still gives *B. proteus*. The man felt so much better that he was allowed up in a chair on Feb. 25, and a week later he was able to walk. The improvement has been maintained and he has recovered much strength in his upper limb, but abduction is still weak owing to the gross destruction of the deltoid muscle.

CASE 2.—A private, aged 27, received a bullet wound on Jan. 31, 1942, which passed through the left elbow, producing comminution of the radius and capitellum. On admission to a base hospital, 8 days later, his general condition was poor and the plaster on his left upper limb was stained with discharge. On Feb. 12, under pentothal anæsthesia, the plaster was removed and he was seen to have two wounds, an entry wound just lateral to the olecranon and an exit anteriorly in the antecubital fossa. Both wounds were discharging freely and the elbow-joint was swollen, due to septic arthritis. The joint space was opened freely, 5 g. sulphanilamide introduced and the wounds covered with vaseline gauze. An abscess of the forearm was opened and drained by two incisions. It was found impossible to straighten the elbow (with a view to applying extension) owing to the risk of hæmorrhage from the stretched brachial artery in the highly septic wound. A plaster was applied with a window cut to allow free discharge, and the man was given

42 g. sulphanilamide by mouth spread over 6 days. Cultures of the pus gave a pure growth of hæmolytic streptococci.

His general condition slowly deteriorated, and when the plaster was changed on March 6 the wounds were still discharging and the joint condition was no better. In addition he had developed a small abscess along the inner side of the arm, which was incised. Sulphanilamide was again introduced into the wounds. After this operation he remained comatose for 3 days and it was assumed that this was due to the administration of pentothal in his toxic state. His blood-urea at this stage rose to 42 mg. per 100 c.cm.; his blood-culture was sterile. After receiving 3 pints of blood, 350 c.cm. glucose saline and 700 c.cm. normal saline, he improved considerably, but the discharge from the elbow continued to be profuse. Cultures of the pus still gave a growth of hæmolytic streptococci.

On March 20, under gas and oxygen anæsthesia, the plaster was again changed. The local condition showed no improvement and pus was draining freely from the elbow and from the incisions in the arm and forearm. Proflavine powder was introduced into the elbow-joint and also into the arm and forearm wounds, about 2 g. in all being employed; a fresh plaster was then applied. After this operation the man stated that his elbow felt more comfortable than it had done since he was wounded, his appetite improved, he slept much better and there was a noticeable change in his general health. Within 10 days he was able to get up and since then his condition has improved steadily.

A month later when his plaster was changed the wounds of the arm and forearm were practically healed, the elbow wounds were smaller and almost dry, and now only *B. proteus* could be grown in cultures.

CASE 3.—A warrant officer, aged 29, sustained multiple wounds in a bomb explosion on Nov. 21, 1941. His most serious injury was a penetrating wound of the right knee, with partial comminution of the lateral femoral condyle and outer margin of patella. He was treated in a field ambulance within a few hours, the knee wounds were cleaned up and sutured and the limb fixed in a posterior plaster slab. He did not arrive at the base until 12 days later; by then he was very ill. He arrived late at night, in no state to stand operation, so his wounds were merely dressed and he was given morphia and 3 pints of blood by drip transfusion. Next morning he was slightly better, and as it was clear that the right knee was infected he was given pentothal and the stitches were removed from a large lacerated wound just above the patella. Pus escaped under great tension (*Strep. hæmolyticus* and *Strep. viridans*); 10 g. sulphanilamide was inserted into the joint, the wound was left widely open and he was fixed on a Braun's frame with skin extension. Before admission he had received sporadic doses of sulphapyridine, and after admission he was given 3 tablets 4-hourly for 4 days. Then he complained of sore throat (culture gave hæmoltyic streptococci) and as his white-cell count was only 9400 the chemotherapy was stopped and he was given another 4 pints of blood. His convalescence was very stormy and amputation through the right thigh was considered several times, but by the end of January, 7 weeks after admission, it was clear that he was on the up-grade. During January successive cultures of pus at weekly intervals gave the following results: (*a*) *Strept. viridans* and *Staph. aureus*; (*b*) *Staph. aureus* and non-hæmolytic streptococci; (*c*) *Staph. aureus*; (*d*) *Staph. aureus* and *B. proteus*. At this stage the discharge was very free and the temperature and pulse-rate had subsided to normal, so fixation in plaster was employed.

On April 24 the wound above the right knee was still large ($4\frac{1}{2}$ in. × 2 in.) and discharging very freely (*Staph. aureus* and *B. proteus*) when it was decided to use proflavine powder. Approximately one gramme was introduced into the suprapatellar synovial pouch, the lateral side of the knee and behind the patella, and the leg was fixed in a closed plaster extending from the upper thigh to the ankle. A week later he was able to move around on crutches, and whereas previously the discharge had been very profuse it now dried up almost completely as judged by the condition of the plaster, which remained firm and dry. When the plaster was removed a month later the wound only measured about 2 in. × $\frac{1}{2}$ in. It was completely healed by mid-April and has not broken down since, although the patient is walking about unaided. The knee is almost completely stiff, but considering that he had a severe septic arthritis the result is satisfactory, and undoubtedly the local improvement dated from the use of proflavine.

CASES 4 AND 5.—Two other similar cases of septic arthritis of the knee due to war wounds might be quoted where the results were equally satisfactory and where the improvement was definitely more rapid after the use of proflavine. One of these men had also a septic arthritis of the elbow which responded favourably to proflavine, and it is worth mentioning that in both cases sulphanilamide and sulphathiazole had been fully exploited before proflavine was employed.

CASE 6.—A driver, aged 23, was involved in a motor-cycle accident on March 4, 1942. His only serious injury was a penetrating wound of the right knee with slight comminution of the lateral femoral condyle and patella. He was operated on in an advanced hospital within 5 hours of the accident, the wound edges were excised, the skin edges only were sutured, and plaster was applied from the thigh to the foot. On admission to a base hospital 3 days later the man looked ill, his toes were very blue and swollen, and he complained of much pain in the right leg and knee. The plaster was split at once with immediate relief, but next day he was again in great pain, so pentothal was given and the plaster was completely removed. A 4 in. wound on the outer side of the knee was found to be closed with two sutures, and when these were removed thin pus escaped freely from the joint, along with pieces of sloughing synovial membrane. A fresh posterolateral drainage incision was made in a dependent position, about 10 g. of powdered sulphanilamide was introduced into the joint, the wounds were left completely open, and the limb was fixed in a Braun's frame with extension by skin traction. He was started on a course of sulphanilamide by mouth, but this was stopped after he had received 18 g. because the report on the pus (received on March 11) showed that the infecting organism was a hæmolytic *Staph. aureus*.

His general condition improved only temporarily after operation and 3 days later he was dangerously ill, with severe confusion and delirium and a very poor pulse. When the bacteriological report was obtained on March 11 it was decided to use proflavine, and on March 12 pentothal was given and 2 g. proflavine was dusted into the joint and wounds. Next day he was no better, but 2 days later there was obvious improvement, especially in the mental condition, and he began to evince interest in food and in his surroundings. By March 20 he had little or no pain and the discharge was so much diminished that the limb was encased in plaster. This plaster was retained for 3 weeks and then was changed under pentothal anæsthesia. The size of the original wound had diminished by about a half and the counter-incision was practically healed; culture of the pus gave *B. proteus* only. Now he is much better generally and is able to get around on crutches, while the discharge has almost ceased.

The improvement in this case was evident within 2 days after using proflavine, and it has been maintained, whereas the first operation at the base hospital (free drainage plus sulphanilamide) produced only temporary improvement.

CASE 7.—A private, aged 27, was shot through the left wrist on March 21, 1942. He sustained fractures of the lower end of the radius and adjacent carpal bones. The wounds were excised and plaster applied in a field ambulance the day after wounding. On admission to a base hospital 8 days later his general condition was poor and it deteriorated in the next few days. On April 2 the temperature swung up to 104° F., his pulse was 120 and he became delirious. On April 3, under pentothal anæsthesia, his plaster was removed and it was clear that he had a septic arthritis of the wrist; the infecting organism was a hæmolytic *Staph. aureus*. Free drainage was provided, 0·75 g. proflavine was introduced into the wounds and a fresh plaster applied. His temperature and pulse were almost down to normal within 24 hours, his pain had gone, his delirium ceased and his general condition improved so rapidly that he was allowed up 5 days later.

The plaster was changed on April 25. By then the wounds were much smaller and the discharge scanty, but hæmolytic *Staph. aureus* could still be grown on culture. Now, on April 27, his general condition is excellent.

The improvement in this patient after the operation and the use of proflavine seemed more rapid than in cases of similar severity where this drug was not employed. For examples, two officers with almost identical lesions, whose treatment began in December, 1941, made much slower progress.

CASE 8.—This minor case is quoted to show that proflavine does not necessarily delay healing.

A medical officer developed septic sores of his right middle and ring fingers, and the areas spread slowly despite local

applications of sulphanilamide powder for 9–10 days, and administration of 12 g. sulphanilamide by mouth in 4 days. He consulted one of us 10 days after the onset and it was found that he had two spreading ulcers, each 1¼ in. × ¾ in. in extent, over the dorsal aspects of the proximal interphalangeal joints of the right middle and ring fingers, with enlargement and tenderness of the epitrochlear gland. Culture of the pus gave *Strep. hæmolyticus* and *Staph. aureus*. The dead skin was cut away, and as chemotherapy had proved unsuccessful it was decided to change the treatment. Proflavine powder was therefore applied to the raw surfaces, and next day a thin brownish pellicle had formed over the areas. Two days later pus had accumulated under the pellicle on the middle finger, so the pellicle was cut away and fresh proflavine applied. The area on the ring finger was healed within a week and the middle finger lesion in 11 days after the start of proflavine therapy. The lymphadenitis subsided pari passu with the local improvement.

Compared with many similar infections treated by other methods, the healing in this case was equally rapid, and the new skin was supple, not interfering in any way with joint movements. The interesting fact also emerged that proflavine locally was more effective than sulphanilamide in controlling a mixed *Strep. hæmolyticus* and *Staph. aureus* infection in this case.

DISCUSSION

Acriflavine has always been the favourite among the acridine group of antiseptics despite the fact that a number of investigators such as Albert and others (1938), Russell and Falconer (1940–41), Falconer (1940), and Manifold (1941) have all emphasised as a result of their experimental work that while proflavine is as effective as other flavine compounds in regard to its bactericidal action it is less toxic than acriflavine. It has also been shown that 2 : 7-diaminoacridine hydrochloride is even less toxic than proflavine (2 : 8-diaminoacridine sulphate), and Manifold (1941) summarises the matter thus: "Acriflavine is a mixture and presumably may vary quite widely in composition from time to time and from one manufacturer to another. It is not significantly superior bacteriostatically to either proflavine sulphate or 2 : 7-diaminoacridine hydrochloride, both of which compounds, particularly the 2 : 7-diaminoacridine hydrochloride, have a minimal toxic effect on the tissues. ... On these grounds it is felt that in spite of the wide interest in acriflavine its use as a local or internal antiseptic should be discouraged, and proflavine sulphate or more particularly 2 : 7-diaminoacridine hydrochloride substituted, since these are pure compounds of invariable composition and low toxicity to the tissues." Hawking (1941) found that: "Applied in strong concentration proflavine will certainly prevent infection of a wound by anaerobes subsequently inserted. On reopening at the third day, wounds which had been treated with 1% or 0·1% solutions showed fairly healthy tissues and only small numbers of bacilli." He concludes that "in view of the mediocre results obtained with acridine compounds in the last war (presumably through inability to reach bacteria situated inside the tissues), the usefulness of proflavine as a wound antiseptic is probably limited." Anderson (1940) found that 1/10,000 solution of proflavine was not effective in treating wounds of mice infected with *Vibrion septique*, but 2–10 mg. of proflavine powder inserted into the wounds produced as good a result as an equivalent amount of sulphapyridine, although healing was somewhat delayed.

The test of any therapeutic agent by clinical means can never approach in exactitude the results achieved under laboratory conditions where the type of wound and infection, and the factors of time and treatment can all be controlled. In clinical practice no two wounds are exactly alike as regards size, structures involved and degree of infection: while there are other possible confusing factors such as interference with blood or nerve-supply, the varying times which elapse between wounding and the institution of treatment, and variations in the actual mode of treatment before the patient arrives at a base hospital. On the other hand, results obtained in a laboratory are not always an exact guide to what occurs when the same drug is used in man, and few research workers investigating wound infections produce as severe lesions in their experimental animals as those caused by high explosives in man with their often severe destruction of bones, joints and soft tissues. In experimental work it is convenient to infect the wounds with a virulent organism which will kill all untreated animals within 24 hours, and for this reason it is not possible to delay treatment for more than a few hours after infection: there is never time to allow pus formation in the wound before treatment is started. In clinical practice wounds are infected with a great variety of organisms, which are not usually very virulent, but treatment is often delayed for several days, by which time the wound is thoroughly purulent. The presence of pus is known to have an adverse influence on the action of the sulphonamide drugs. Such considerations must be borne in mind in connexion with the subsequent discussion, because the great majority of our cases had been wounded 5–12 days before they came under our care, they had passed through three to eight different medical units before arrival, in these units a great diversity of treatments had been employed, and most of the cases were more or less heavily infected when first seen.

An extensive experience in the treatment of wounds of all grades of severity showed that certain of them were very resistant to treatment. Severe wounds of bones and joints in particular were a problem, for while some did surprisingly well others continued to discharge despite the removal of foreign bodies or sequestra and the institution of free drainage; the presence of such large discharging wounds acted as a constant drain on the strength of the patient. Every suitable case, and that included the majority, was treated by the closed plaster method; sulphanilamide, sulphapyridine and sulphathiazole (locally, by mouth and occasionally intravenously) were used according to the type of case and the nature of the infection. It has not yet been possible to try sulphadiazine except in a few cases owing to lack of supplies. Various forms of treatment, apart from routine chemotherapy and closed plaster, were tried in resistant cases, including plain saline or vaseline dressings, hypertonic salt solutions (sodium chloride and sodium sulphate), urea, eusol, acriflavine (1/1000), gentian violet, brilliant green, hydrogen peroxide, and glycerin and sulphanilamide solutions; blood-transfusions whenever necessary; reduction of the carbohydrate intake, and regular courses of ascorbic acid; and physiotherapeutic methods in the form of ultraviolet light, radiant heat and infrared radiations were also employed. A number of cases, however, failed to respond despite everything tried, and it was this failure which led us to attempt a new treatment in the form of proflavine powder dusted into the wounds.

The amount of proflavine used therapeutically has never exceeded 2 g. in any one case, and usually only about 0·5 g. or less was employed, depending on the size of the lesion. It was introduced into cavities by means of a small Volkmann's scoop or the end of a blunt dissector, or in cases where there was an extensive wound it was dusted over the entire surface and evenly distributed with a spatula or scalpel handle. It was never employed on more than 2 or 3 consecutive occasions, 4–28 days elapsing between the applications. When used prophylactically the amount varied according to the size of the lesion, but was usually about 0·25 g., mixed with 2–5 g. powdered sulphanilamide. So far the two drugs have seldom been combined during the treatment of established infections. The drug used throughout was proflavine sulphate (2 : 8-diaminoacridine sulphate) as we had no supplies of 2 : 7-diaminoacridine hydrochloride.

From the prophylactic aspect, it is impossible to assess the relative value of proflavine and sulphanilamide because the two drugs have always been used together, and then only as an adjunct to surgical measures. In 7 cases of compound fracture of the tibia and fibula and one compound fracture-dislocation of the wrist, all heavily contaminated, where early operation was combined with the prophylactic use of proflavine and sulphanilamide, none subsequently developed infection. There is no evidence that repair of either the bones or soft tissues has been delayed, and this is important, for it would be foolish to use any substance to combat a problematical infection if it interfered appreciably with healing. As regards sulphanilamide this point has already been established after its use in hundreds of

cases, including many infected compound fractures, where healing has been almost as rapid as in simple cases. Therefore for prophylaxis sulphanilamide should always be preferred, and until further evidence accumulates as to the effect on healing it would be unwise to use proflavine as a prophylactic agent except in small doses (0·25 g. or less); such small amounts may be quite sufficient to prevent the development of staphylococcal infections.

We are on surer ground when we come to discuss the therapeutic effect of proflavine in cases of established infection. Where staphylococci are the infecting organisms proflavine has proved more effective in controlling or eliminating the infection than any other drug or method of treatment—e.g., sulphathiazole—so far tried. It should be made clear that proflavine has never been used except as a local application. Sometimes the staphylococci disappear entirely, but even if they persist both the local and general condition improve after treatment. When some operative procedure is combined with the use of the powder, it is impossible to tell how much of the improvement is due to the surgeon and how much to the drug; but by contrast with other similar cases we feel certain that those in which proflavine was used did the better. Thus two cases of septic arthritis (cases 6 and 7), one of the knee and the other of the wrist, both infected with hæmolytic *Staph. aureus* and both dangerously ill, improved rapidly after the institution of free drainage and the instillation of pure proflavine. Doubtless the operation was the chief factor in the improvement, but by comparison with other cases of septic arthritis it seemed to be more rapid than usual and it was maintained. Case 1 is important in this respect, because the proflavine was the only measure employed immediately before his dramatic change for the better.

The benefits of proflavine treatment are not confined to patients with staphylococcal infections. Indeed many cases have shown improvement irrespective of the type of infecting organisms, and when used in a highly concentrated form proflavine appears to be active against all the common pyogenic organisms. *B. proteus*, however, appears to be more resistant to its action than any of the other common organisms, and this bacillus has an annoying habit of appearing in wounds despite every precaution to prevent infection; fortunately it does not appear to have a high toxigenicity. It will be noted also that proflavine may produce good results in cases which have failed to respond to sulphanilamide and other drugs of this series. It is not suggested that proflavine should supplant sulphanilamide and its allies as a prophylactic or therapeutic agent, except perhaps in cases where the infection is known to be staphylococcal. In such cases local application of proflavine, with the general administration of sulphadiazine or sulphathiazole, may be found the best combination.

The effect of proflavine in drying up a wound is sometimes remarkable, and often a thin eschar forms over the wound, not dissimilar in consistence to that produced by tannic acid in burns, while, just as in tannic acid therapy, pus occasionally forms under the pellicle. When the discharge is very profuse this process is less liable to occur. In some cases a brownish scab forms over the wound which is slowly raised from the surface by the formation of a gelatinous material beneath, possibly coagulated serum. In 5 or 6 out of the 80 cases of this series where proflavine has been employed there has been no improvement. Proflavine has often been employed in conjunction with the closed plaster technique, and in cases where the wound is not so covered dressings are performed as infrequently as possible—every fourth to seventh day depending on the amount of discharge.

Several of the cases quoted supply evidence that, contrary to expectations derived from experimental work, healing is not apparently delayed, but in this connexion one case should be quoted. An officer with a chronic tibial abscess, the sequel of a gunshot wound, had "saucerisation" performed. The extensive bone cavity was filled with a mixture of about 10 g. sulphanilamide and 2 g. proflavine, and after 6 weeks practically no new bone had formed. Ten weeks after the operation new bone was forming and the cavity was healing, but the process had been slower than usual. Whether this was the result of using the chemicals or whether it was due to other causes we cannot tell. Against this case we can place the undoubted fact that in 79 cases with bone, joint and soft-tissue injuries no appreciable delay in healing has occurred.

Most patients find the dressing painless and unirritating, although a few complain of a slight burning sensation which soon abates. No general toxic manifestations, such as skin eruptions, albuminuria, jaundice, nausea, vomiting or headache, have been encountered.

SUMMARY

Proflavine is much less toxic than acriflavine and it has been used in pure form as a dressing for certain intractable wounds.

So far it has been used therapeutically in 80 cases, with beneficial results in almost every case.

Where staphylococci are the infecting organisms, proflavine has proved more efficient in controlling or eliminating infection than any other drug so far tried, and many cases with mixed infections have also responded well.

With the possible exception of one case, no interference with healing has been noted.

Most patients find the dressing painless, and no general toxic manifestations have been noted.

Our thanks are due to Colonel H. D. F. Brand, OC 15th Scottish General Hospital, for permission to publish this article, to the sisters and orderlies in the orthopædic wards and theatre who have assisted in the clinical work, and to the staff of the pathological laboratory who have examined and reported on so many specimens.

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NICOTINIC ACID IN TREATMENT OF ANGINA PECTORIS

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THE use of nicotinic acid in the treatment of pellagra has achieved much prominence in the last few years, especially in the United States. In view of the advantages claimed for this substance in pellagrous psychosis, it was decided that a trial of its possibilities should be made with patients whose mental symptoms were of a similar, though not completely corresponding type. These investigations have led to the present work. Six cases of angina pectoris have been treated with nicotinic acid, and the results in this series appear to be remarkably uniform and lasting.

Administration of the drug by mouth caused in several cases a noticeable decrease in number and severity of attacks, but in others the effect was transient, possibly because of interference with absorption or interaction of chemical substances in the gastric secretion. Moreover the drug could not be discontinued without relapse, and the treatment appeared therefore to be merely symptomatic. Intravenous administration heightened the efficacy of the drug. It was therefore decided to discard tablets of nicotinic acid, in order to obtain equal conditions for each case and an evaluation of the treatment after its discontinuation. A drip infusion of a 0·05% solution of nicotinic acid was chosen to overcome differences in susceptibility to nicotinic acid; isotonic solutions are rapidly absorbed, giving sufficient concentration of the medicament in a short time. One infusion containing 100–300 mg. produced as a rule a remarkably beneficial result, which was maximal after 12–24 hours. Further infusions seemed to cause a definite stabilisation in the condition of the patients, who became free from anginal attacks after several weeks, the worst cases reacting best. In most cases it was considered sufficient to give six infusions, so that treatment finished after approximately 3 weeks, though in some cases more

treatment may be required. We now have 6 cases showing complete or almost complete regression of symptoms of angina pectoria over a period of 3–7 months after completing the course of treatment; 3 cases have actually resumed heavy manual work.

CASE-RECORDS

CASE 1.—A builder, aged 65, who had always been healthy until the first attack of substernal pain 2 years ago. Continued to work with the help of nitroglycerin tablets. The pain, constricting and burning in type, radiating into both arms, became gradually worse, especially in cold weather. In autumn, 1941, frequent attacks of pain caused him to retire from work. No dyspnœa at rest, but slightly breathless on exertion. Physical examination of the heart did not reveal any enlargement, sounds faint, no murmur; resting BP 120/80 mm. Hg. Pulse regular, 84 per min., radial and retinal vessels appeared normal. He was tested to ascertain the amount of effort necessary to cause anginal pain; 17 steps of the usual type of staircase caused intense pain, with BP 180/110 mm. Hg, pulse 110. Treatment started Feb. 2, 1942. Next day reduction in pain was noticed, and patient felt able to walk a short distance; after the 8th infusion on March 21, he could dig a plot 10 ft. by 20 ft. in his garden in less than an hour without pain. After the 10th treatment he was tested again; 193 steps of the same staircase were mounted, going very quickly up and down. This exercise was interrupted because no pain was felt, and it appeared unnecessary to continue the test. When re-examined on July 7, 1942, he was doing the work of a man in good health, did not take any drugs, and had no pain, though he carefully abstains from sudden exertion.

CASE 2.—A cotton spinner, aged 50. No history of serious illness. Started to become breathless on exertion 8 months ago; 2 months later had acute attacks of heartburn and indigestion, especially after an effort. He took alkaline powders, and they helped to a certain extent. Again 2 months later, after a brisk walk, had intense substernal pain and had to stop. This pain forced him to give up work, because it reappeared frequently from that time after exertion. Examination on March 10, 1942, showed no dyspnœa at rest, but breathlessness on exercise. No signs of congestive failure or cardiac enlargement; heart sounds faint. Systolic murmur over base of heart. No abnormality of peripheral and retinal vessels. Pulse 90 per min. Resting BP 130/90 mm. Hg. Wassermann reaction negative. No signs of renal defect. On mounting a staircase, 38 steps caused an anginal attack, which forced him to stop. BP shortly afterwards, 170/70 mm. Hg, pulse 96 per min. Nine minutes later, at 4.24 PM, infusion was started, BP fell from 135/75 to 118/80 mm. Hg. Pulse-rate fell from 90 to 68, but later remained around 78 per min. Infusion finished at 5.40 PM. At 5.45 the patient was retested; 95 steps of the same staircase were mounted very quickly. Became breathless, but did not experience any pain at the end of this exercise. Next day was tested by a walk of ¾ mile, slightly uphill. Became very breathless but felt no pain. Three infusions were given. He felt fit after this treatment, and has since resumed work. Re-examined on July 24, 1942. Has been employed at his former job for the last 3½ months. Does hard work every day, but abstains from sudden exertion, has not experienced any pain, and feels extremely fit.

CASE 3.—A farm hand, aged 27, with congenital syphilis. No external signs of syphilis. Never been seriously ill and is in fine physical condition. WR ++. Examination of CNS entirely negative; no signs of heart-failure; no dyspnœa on exertion; no enlargement of heart and no murmur; second aortic sound slightly accentuated. Pulse regular, 76 per min., BP 130/80 mm. Hg. Came under observation on account of unbearable pain in chest, radiating down inner side of left arm, and once into both arms. First attack occurred in July, 1941, after effort. On two occasions pain became unbearable, and he had to lie down and keep immobile for 5 minutes before it ceased. Left arm was sore during and after attacks of pain, which usually lasted 4–5 min., unless interrupted by a nitroglycerin tablet. Received antisyphilitic treatment, starting with small doses of iodine and bismuth. Later neoarsphenamine was given and well tolerated. No change in the anginal syndrome. Treatment with nicotinic acid started Jan. 23, 1942. Soon after first infusion reported a decrease in pain during attacks. After three infusions took up work again, and has remained a very active worker. Has no pain except when starting a sudden and sustained effort. Even then he has not to stop but only to slow down to get relief. It seems evident that the orifices of the coronary arteries have been narrowed by a syphilitic process and the anginal pain therefore returns when the structural changes do not allow a sufficient amount of blood to enter or to leave the coronary system.

CASE 4.—A bus driver, aged 58. Was forced to give up work 5 years ago on account of mitral stenosis. Very dyspnœic on slightest exertion; has a persistent irritating cough. Radial vessels slightly harder than normal. Pulse irregular (frequent extrasystoles). At times pulse grossly irregular, due to transient auricular fibrillation. BP 180/110 mm. Hg. In 1938 experienced first substernal pain. Afterwards attacks came on at any time after slight exertion and after food. When mild they had the character of acute indigestion and fullness in the chest, when stronger a burning pain radiated into both arms, especially down the inner side of left arm. First treatment Feb. 4, 1942. Morning after infusion was able to rise without pain and to start dressing immediately, instead of sitting on the edge of the bed to overcome the first anginal attack. Received six infusions within 3 weeks. Has had no further anginal attacks. Now works in his wife's business, can walk 5 miles, and is generally active and independent.

CASE 5.—A widow, aged 62. Was a cotton spinner until 2 years ago, since when has not worked because of pain in chest, which became gradually worse, was burning in character radiating into left arm. Pain easily caused by short walk or by exercise after a meal. Worse in cold weather. No dyspnœa at rest, but breathless on exertion. Physical and X-ray examination show only moderate enlargement of heart, but well-marked dilatation of aorta. Blowing diastolic murmur in aortic area. Water-hammer pulse. Radial and retinal vessels slightly tortuous. WR negative. Resting BP 135/85. After first infusion on May 4, 1942, much better nights. Acute attacks of pain disappeared entirely, but still felt oppression in chest during long walk. After third infusion this oppression also disappeared. Now undertakes much more exercise, and has regained her old confidence. Tested on a walk, approximately 1 mile, going slightly uphill: no pain but tired and breathless.

CASE 6.—A gardener, aged 60. Illness started in May, 1941, with attack of breathlessness on exertion. Stayed off work for a week. Shortly afterwards had acute attack of pain in chest while lifting window of a greenhouse. Attack was severe, lasting for a long time, and only passed slowly away on sitting down. Left arm remained sore for long time afterwards. Since then pain has frequently recurred. Only caused by exertion, is continuous, and passes away when he rests. It is of burning and gripping type. Not breathless at rest; no signs of cardiac failure or of a vascular lesion. Heart shows neither clinical nor X-ray signs of enlargement. Peripheral and retinal vessels slightly thickened and tortuous. WR negative. Resting BP 165/90 mm. Hg. Pulse-rate 84. Average number of steps of usual type of staircase required to produce pain was 60. BP afterwards 210/110. Pulse-rate 120. Abnormally breathless. First treatment March 19, 1942. Improved considerably. Retested after third infusion on May 27. Amount of exercise tolerated now limited by breathlessness, not by pain. Has had no anginal attack since first infusion, sleeps much better, has taken up light work again, and regained some of his old confidence, though he still abstains from exertion.

PHARMACOLOGY

Most of the clinical work with nicotinic acid, apart from pellagra, was based on its vasodilating action, which appears to be independent of its action as a vitamin. This effect is, however, of short duration, and elimination of the drug by the body is probably completed within a few days. To account for the lasting results in the foregoing cases, we have compared the action of nicotinic acid with that of histamine, both of which have a heterocyclic ring —N— with a substituent group in beta position. Though there is no obvious chemical relation, a resemblance between the pharmacological action of histamine and nicotinic acid was found.

The well-known reactions following a subcutaneous or intravenous injection of 0·1 mg. of histamine sodium phosphate can be nearly reproduced by a 50–500 times larger quantity of nicotinic acid. The effects of such a dose of nicotinic acid are as follows.

On smooth muscle.—No effects in normal persons, except in two who complained of severe cramp-like pain in the epigastrium after 5 mg. of nicotinic acid intravenously. A delayed

action was noted in 3 asthmatics; 2 reported severe asthmatic attacks after taking 50 mg. of nicotinic acid by mouth, the third, who received 100 mg. by intravenous infusion, reacted with a violent attack 15 hours later. In 4 other cases, however, the effect appeared so beneficial that ephedrine was replaced by nicotinic acid.

On secretion.—Rise in the volume and acidity of the gastric secretion after 50 mg. of nicotinic acid intravenously. In 2 patients with a fasting achlorhydria, hydrochloric acid appeared in increasing amounts, though the effect was not so great as that produced by histamine. Sweating was never noticed, even with doses of 600 mg., though Forgan (1939) mentioned this action.

On cerebrospinal fluid.—Slight rise in pressure.

On blood-vessels.—Moore (1940) reports that nicotinic acid produces vasodilatation and increased blood-flow in the brain and spinal cord of the cat. Furtado[1] confirmed the cerebral vasodilator action of nicotinic acid. Adams and Robinson (1941) utilised the vasodilatory effect of nicotinic acid with success in 7 cases of trigeminal neuralgia. A headache similar in type to that following an intravenous injection of 0·1 mg. histamine could be produced in 4 patients. It was necessary to give the infusion rapidly. A sense of fullness is first felt, which increases to a sharp headache.

On the heart and blood-vessels.—The responses to a given dose vary in different subjects, and in the same subject from day to day. Because of these variations, every observation has been followed by several control tests, to test and possibly to eliminate the effect of a modifying factor on pulse-rate and blood-pressure. Healthy adults are far less affected than patients, especially those with hypertension. Usually the effects begin within ½–2 min. of the start of the infusion, simultaneously with the flushing of the face and the upper part of the body; the systolic blood-pressure falls 5–40 mm. Hg. The diastolic pressure was little altered, but sometimes rose a few mm. The striking fact which emerges from these observations is the difference between histamine and nicotinic acid in their action on the heart-rate. The former causes a distinct increase, the latter in most cases an equally distinct slowing. The reduction coincides in each case with a fall in blood-pressure, and this relationship cannot be accidental, because it occurred in more than 100 infusions and 40 different patients, though in an equal number of normal controls the results were less definite.

DISCUSSION

The degree of central vagal tone, which exerts a prevailing influence on the heart-rate, runs parallel with the height of the blood-pressure. Nitrites, like histamine, cause a well-marked fall in blood-pressure, and thereby an acceleration in pulse-rate, the action on the vagal tone being a sequel to the change in blood-pressure, and only to a slight degree a direct action on the vagus itself. The question therefore remains how nicotinic acid can cause a fall in blood-pressure, and at the same time a slowing of the heart-rate. One possibility is that nicotinic acid causes a vagal stimulation. This view however implies that production of acetylcholine follows the administration of nicotinic acid, because the vagus produces its effect on the heart by liberating free acetylcholine at its endings. Comparison of nicotinic acid and acetylcholine, by measuring their effect on the frog's heart and rectus abdominis, shows that nicotinic acid has scarcely any effect, and a physiological relationship between the two substances appears unlikely. A second possibility is that nicotinic acid causes a rise of pressure in the cerebral arteries and an increased blood-supply to the brain. Furtado[1] quotes C. D. Aring, who found that nicotinic acid produced an increase in cerebral circulation, accompanied by intense cerebral congestion. This rise of pressure could bring about inverse changes in the arteries of the rest of the body, and, accompanied by reflex cardiac inhibition, would account for the fall in blood-pressure and the slowing of the heart-rate.

SUMMARY

A series of 6 cases of angina of effort have been treated by intravenous infusions of nicotinic acid. Subjective and objective evidence of continued improvement followed and this has been maintained during the last six months. The action of nicotinic acid on blood-pressure and heart-rate was constant in almost every case, both being reduced.

1. Furtado, D. *Lancet*, 1942, i, 602.

DIAGNOSIS OF COMA IN CEREBROSPINAL FEVER WITH DIABETES

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WHEN two diseases, each a cause of coma and each urgently needing specific treatment, simultaneously affect the same patient, accurate diagnosis of both is of extreme practical importance. In a series of 20 cases of meningococcal meningitis treated during the last fifteen months at Addenbrooke's Hospital 4 showed signs of diabetes on admission; 3 of these were comatose and 1 precomatose. These are recorded to emphasise the fact that the two conditions may occur together and to illustrate the difficulties and importance of making the double diagnosis at once.

CASE-HISTORIES

CASE 1.—A woman of 19, admitted comatose on Feb. 23, 1941, with a diagnosis of meningococcal meningitis. The doctor who sent her in did not know she had been treated for diabetes and this was discovered on admission. She had had it since the age of 11, had been taking 30 units of insulin daily and had had six attacks of diabetic coma. On admission she was comatose and dehydrated with sighing respiration, a smell of acetone in the breath, peripheral circulatory weakness, reduced tension of eyeballs, dry furred tongue, head retraction, Kernig's sign, sluggish reflexes, and blood-pressure 100/75 mm. Hg. Temperature 97° F., pulse-rate 130, respirations 24. Urine: specific gravity 1040; orange reduction with Benedict's test; Gerhardt's and Rothera's tests strongly positive. Blood-sugar 0·44%; 0·62% five hours later. Cerebrospinal fluid purulent; meningococci present in large numbers. Insulin, 280 units, given in twenty-four hours (220 units in first twelve). Rectal and intravenous drip saline with glucose. Subsequently insulin 30–60 units daily. Sulphapyridine, 7 g. in first twenty-four hours; total, 51 g. in ten days. She recovered from coma on third day after admission. Recovery uneventful. Discharged on March 19, 1942, on carbohydrate, 200 g. daily, and insulin, 30 units twice daily.

CASE 2.—A woman of 50, admitted comatose on Feb. 25, 1942. She had suffered from diabetes mellitus for 11 years and had been taking protamine zinc insulin, 12 units every morning. On Feb. 23 she retired to bed with pains in her legs and on the day of admission was found unconscious though very restless. No insulin was given. On admission she was comatose and restless with sighing respiration. No dehydration, no smell of acetone in breath, no head retraction or Kernig's sign. Tongue moist; good circulation; blood-pressure 160/110 mm. Hg. Deep reflexes present and equal. Plantar responses extensor. Temperature 102° F. on admission falling to normal; pulse-rate 100; respirations 24. Urine: specific gravity 1040; Benedict's test, orange reduction; Gerhardt's and Rothera's tests strongly positive. Blood-sugar 0·37%. A tentative diagnosis of cerebral thrombosis and diabetes mellitus was made; unfortunately lumbar puncture was not done until twenty-four hours after admission, when purulent CSF was found, with meningococci in pure culture. Insulin, 100 units, was given in the first twelve hours, with rectal salines and glucose and some fluids and glucose by the mouth. On this the blood-sugar fell to 0·17% and the ketone bodies in the urine disappeared although sugar persisted. The coma and general condition did not improve. Twenty-four hours after admission treatment by sulphapyridine was begun and 12 g. was given daily for the next forty-eight hours, mainly intramuscularly. The patient's condition did not improve and she died on Feb. 28.

CASE 3.—A woman of 40, admitted in a drowsy state on March 13 with a two days' history of occipital headache, dimness of vision, pains in the back and retching. She had had a sore throat, cold and cough for five days. On admission she was very drowsy but could be roused with difficulty to answer questions. Stiffness of neck, Kernig's sign and occipital headache present. Blood-pressure 140/95 mm. Hg. Temperature 100° F., pulse-rate 120, respirations 20. Urine: sp. gr. 1030; Benedict's test, yellow reduction; Gerhardt's and Rothera's tests strongly positive. Blood-sugar 0·14%. CSF purulent with meningococci in large numbers. March 15, sugar-tolerance curve: resting 0·14% (50 g. glucose given), 0·21, 0·24, 0·22, 0·16, 0·15. Glucose, 2 g., passed in specimens one and three hours after glucose. Sulphapyridine, 12 g., was

given in first twenty-four hours; 52 g. in eight days. The glycosuria persisted intermittently for four days and then ceased. May 7, sugar-tolerance curve: fasting blood-sugar 0·07%, 0·18, 0·16, 0·06, 0·06, 0·06. No glycosuria. Discharged well on April 10.

CASE 4.—A woman of 26, admitted in coma on March 5, 1942, with a seven days' history of sore throat, pains in the back and aching legs, and a severe headache with nausea for twenty-four hours. On the morning of the day of admission she was found unconscious in bed. She was comatose on admission, with slight cyanosis, cold extremities, shallow breathing and smell of acetone in breath. Left plantar response extensor. Blood-pressure 120/75 mm. Hg. Temperature 102° F., pulse-rate 160, respirations 20. Urine: Sp. gr. 1026; Benedict's test, yellow reduction; Gerhardt's and Rothera's tests strongly positive. Blood-sugar 0·26% CSF purulent, with meningococci in small numbers and a scanty growth of meningococci. Insulin, 30 units, in first twelve hours followed by 10 units twice daily for the next nine days. Intravenous glucose-saline drip. Sulphapyridine, 18 g. intramuscularly in first thirty-six hours; total, 52 g. in ten days. Nasal feeds and daily lumbar puncture while comatose. Partial consciousness returned on March 7 and she became fully conscious on March 9. On March 12 she developed a left facial weakness which had almost cleared up on discharge. Intermittent glycosuria persisted until March 9. March 20, sugar-tolerance curve: fasting blood-sugar; 0·08%, 0·11, 0·14, 0·13, 0·12. No glycosuria. Discharged well on April 4.

DISCUSSION

Ward and Driver[1] describe a case of meningococcal meningitis starting as diabetic coma in a man of 19. Their patient was admitted comatose with flaccidity of all four limbs, a smell of acetone in the breath, glycosuria (3%) and ketonuria. The blood-sugar on admission was not recorded. After 110 units of insulin and 75 g. of glucose in five hours he recovered consciousness; signs of meningitis then appeared and were confirmed by lumbar puncture. Treatment with sulphapyridine was then begun and recovery was uneventful. They suggest two possible explanations of the cause of the hyperglycæmia; pressure on the floor of the fourth ventricle causing the liver to yield up its glycogen, as in the animal experiment by Claude Bernard; or reduction of insulin output owing to the effect of toxæmia on the islet tissue. They favour the first view, and in support of it cite the fact that in this case there was a left facial paralysis, probably due to involvement of the nucleus of the seventh nerve. Twenty-four days after the onset there was no evidence of diabetes as shown by a normal urine and sugar-tolerance curve. Hunter[2] records another similar case of meningococcal meningitis in a child of 4 years in whom the combination of coma, ketonuria and glycosuria at onset led to the provisional diagnosis of diabetic coma. Here the glycosuria cleared up after sugar and 15 units of insulin, and the sugar-tolerance curve was subsequently found to be normal.

Of the 4 patients reported here, case 1 is an example of diabetic coma precipitated by meningococcal meningitis in a known diabetic. Here the clinical signs of diabetic coma were typical. There was well-marked dehydration, peripheral circulatory failure, low blood-pressure, a smell of acetone in the breath, pronounced ketonuria and glycosuria and a high blood-sugar. There were also unmistakable signs of meningitis. The immediate treatment of both conditions was urgent; it was given and the patient recovered. Case 2 is an example of meningitic coma in a known diabetic. There was a long history of diabetes but the clinical picture was not at all typical of diabetic coma for there was no dehydration, the peripheral circulation was good, the blood-pressure high and there was no acetone in the breath. There was also no evidence of meningitis except coma. Here the diabetic factor in the coma, which was probably small, was treated at once but there was delay in treating the meningitis and the patient died. Cases 3 and 4 are examples of a transient diabetic condition secondary to cerebrospinal meningitis similar to those described by Ward and Hunter and like theirs clearing up completely as the meningitis was cured. In such cases it is important not to overtreat the diabetes or overlook the meningitis. In case 3 the symptoms and signs of meningitis were so definite that diagnosis was clear and the diabetic symptoms were slight and did not need treatment. In case 4 diagnosis was much more difficult. The complete absence of signs of meningitis, poor peripheral circulation, altered breathing and smell of acetone in the breath, with glycosuria, positive Gerhardt's test and blood-sugar of 0·26% were all suggestive of diabetic coma, though 0·26% was very low for such severe coma. Against this diagnosis was the comparative absence of dehydration, the relatively high blood-pressure of 120/75 mm. Hg, and the rapid response of the ketonuria, glycosuria and blood-sugar to glucose, fluids and a small dose of insulin. In this case it is clear that the main cause of coma was meningitis but the ketosis was probably an additional cause and its control by small doses of insulin may have helped towards recovery. Here also as in Ward's case there was a left facial palsy.

Meningococcal meningitis complicating true diabetes is probably rare, while a transient glycosuria and ketonuria in the early stages of meningococcal meningitis is not uncommon. In all such cases the relative importance of the diabetic and meningitic factors must be accurately assessed since the right treatment depends on this. Diagnosis is often made more difficult by the fact that patients in coma can give no history and there may be none available; this confirms the necessity for a diabetic always to carry a card stating the diagnosis and insulin dosage. Mistakes will be avoided if the association of the two conditions is remembered, if the clinical features of the coma are carefully considered, and if a lumbar puncture and blood-sugar are done at once.

1. Ward, C. W. and Driver, A. A. *Lancet*, 1940, ii, 228.
2. Hunter, R. R. *Ibid*, 1940, ii, 604.

SUMMARY

The association of meningococcal meningitis, diabetes and coma is illustrated by four cases: (1) diabetic coma in meningitis; (2) meningitic coma in diabetes; (3) two cases of meningitis with transient diabetes, one comatose and the other precomatose.

I wish to thank Dr. C. H. Whittle for the pathological and Dr. N. R. Lawrie for the biochemical investigations of these patients.

IMMUNISATION WITH TAB IN AN OUTBREAK OF PARATYPHOID FEVER

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AN outbreak of paratyphoid fever presenting some interesting features occurred in Netherne Hospital in June, 1940. The epidemic was limited to one villa containing 80 patients, a mixture of mental defectives and cases of secondary dementia; 55 were from time to time incontinent and unclean in their habits.

The villa is self-contained and staffed by 8 nurses who sleep on the premises. Food is not prepared there but is supplied from the main kitchen and is identical with that served to patients in the rest of the hospital: on arrival at the villa it is heated and served out in the kitchen. The milk and water supplies are identical with those to the main building. Two airing gardens are used, one of which had a fairly large patch of grass. This has since been replaced by asphalt as it was thought that an incontinent carrier might have fouled the grass and thus infected a garbage eater.

The first case developed on June 7. An idiot, who was known to eat any rubbish available, became ill with diarrhœa, vomiting and pyrexia. She was nursed in a side room but was not strictly isolated. Next day a second patient was found to be ill, but since she showed no gastro-intestinal symptoms the nature of the illness was still unsuspected. On June 12, however, 5 other patients developed diarrhœa, vomiting and a rise in temperature. Strict isolation was then practised, but during the following six days 12 further cases developed, the last on June 27.

The ages of the patients ranged from 3 to 60 years, but most of them were in their teens. The course of the

illness was variable. In some cases the temperature settled in two or three days and the vomiting and diarrhœa were mild; in others the temperature remained stationary at about 102° F. for two to three weeks, gastro-intestinal symptoms were acute and the general condition poor. The spleen was palpable in 3 cases, and in a fourth reached half way down to the umbilicus. Crops of rose spots were found on the chest and abdomen in about a third of the patients; 2 cases developed pneumonia. Out of a total of 19 cases 4 died; all 4 were idiots and 2 were so difficult to manage that they were on a chloral and bromide mixture at the time. All the patients in the villa were kept under observation, and morning and evening temperatures were taken. On June 26 all except those with clinical signs were given 0·2 c.cm. of TAB vaccine (PDCo), and this was followed by 0·5 c.cm. and 1 c.cm. at weekly intervals. After the first dose of vaccine, one patient developed a mild pyrexia which lasted for a few days, and she has therefore been classified as a case, but otherwise no further cases occurred.

Before June 30 the fæces and urine had been examined only in patients showing clinical evidence of disease, but from then onwards weekly routine examinations were made on all the occupants of the villa. At the first survey 23 patients were found to be excreting *Bacterium paratyphosum B* in the fæces without showing any symptoms, and they were regarded as subclinical cases and isolated. In these patients it was impossible to determine the date when infection had begun, and the period over which they carried had therefore to be calculated from the time when the first examination was made. Cultures from the fæces showed that of the 15 clinical cases which survived 10 were free from *Bact. paratyphosum B* within six weeks; 2 patients carried the organism for nine to ten weeks, one for at least thirty-six weeks, and 2 others are still carrying after an interval of more than 2 years.

Among the 23 subclinical cases, 14 were free from *Bact. paratyphosum B* within two weeks of the first examination, 4 within four weeks and 3 within eight weeks. One patient is still carrying and another patient, after remaining negative for fourteen months, suddenly became positive and has remained so.

The source of the epidemic has not been determined. Routine examination of the milk and water supplies was carried out and the excreta of the entire kitchen staff were examined, with negative results. Since the epidemic was strictly limited to the one villa it was considered most likely that one of the recent admissions to this block was an undiagnosed carrier. Only 4 patients had been admitted within the preceding six months. Of these, 2 developed symptoms of enteric infection and the infecting organism was isolated from the stools. In both the fæces became negative within a fortnight and have remained so during all subsequent examinations. A third patient was found on one occasion to be carrying *Bact. paratyphosum B* in the stools, but also became permanently negative within a few days. The fourth patient has never shown evidence of the disease nor have cultures of the fæces or urine ever yielded *Bact. paratyphosum B*. It therefore seems unlikely that any one of these 4 was instrumental in originating the outbreak under consideration.

One other possibility relates to a patient who was admitted into the villa a year before the epidemic. She was transferred from the main block of the hospital, and it was known that enteric infection had occurred there more than once some years previously. When the fæces of contacts were first examined she was found to be carrying *Bact. paratyphosum B* and has been carrying continuously ever since in spite of drastic treatment. She may have been a chronic and undetected carrier when transferred from the main block, but if so it is difficult to explain the interval of a year which elapsed before symptoms broke out among her fellow patients.

BACTERIOLOGICAL TECHNIQUE

Throughout this investigation all specimens of fæces and urine were sent to the laboratory on the day they were taken. Once the nature of the epidemic had been established, the routine method of examination used was as follows.

A thick suspension of the fæces was made in peptone water and was plated directly on to MacConkey's medium. A drop of this suspension was also added to a tube of sodium tetrathionate broth, and to each of 7 tubes of peptone water containing brilliant green in dilutions of 1 in 70,000 up to 1 in 1,000,000. Next day the MacConkey plates were examined for the presence of non-lactose fermenters and these were identified in the usual way. The brilliant green and tetrathionate cultures were plated out on MacConkey's medium and examined after twenty-four hours' incubation. Urines were spun down and the deposit plated directly on to MacConkey's medium.

Our results were similar to those obtained by other workers and require little elaboration. Of the first 82 positive fæces examined only 34 yielded the organism on direct plating. In the remaining 48 cases, the organism was isolated from both the brilliant green cultures and the tetrathionate broth in 24 instances, from brilliant green cultures only in 14, and from the tetrathionate broth alone in 10. There is thus a strong case for the use of all three methods in routine examination.

Examination of urines yielded consistently negative results, but the difficulty of obtaining catheter specimens from these patients made it impossible to carry out an extended series of investigations. The antibody response was not determined since vaccine was given to all the occupants of the villa early in the outbreak.

DISCUSSION

The proportion of those exposed to infection who either developed the disease or became temporary carriers is surprisingly high. At the first survey, 42 patients out of 80 were found to be carrying *Bact. paratyphosum B* in their stools; 19 of those were typical cases, the other 23 gave no clinical evidence of the disease. This figure may well have been higher since routine examination of the stools was not begun till about three weeks after the first case had occurred. The closed nature of the community and peculiar facilities for the spread of infection afford an obvious explanation of the high proportion obtained.

The ratio of transitory carriers without signs to typical cases of the disease is higher than would have been expected. Klinger (1909), however, found that of 211 transitory carriers only 92 gave a history of previous enteric infection. The remaining 119 had never to their knowledge had the disease. It seems possible, therefore, that during an epidemic the number of subclinical cases who carry the infecting organism may exceed those developing symptoms. Most of the 23 cases we detected may belong to this category. On the other hand, it is known that enteric organisms may be isolated from the stools during the incubation period and that this period may be as long as 38–40 days (Miner 1922). It is reasonable therefore to consider that some of the 23 carriers were potential cases.

There is a tendency for epidemics to limit themselves spontaneously. Most cases occur in the first few weeks after the appearance of the primary case, and there is then a gradual decline. The epidemic under consideration, however, ceased abruptly less than three weeks after the development of the first case, and this in a community which must continuously have been open to reinfection. Did mass immunisation in some way limit the spread of infection and the development of the disease? Vaccine was given to all the patients without clinical signs, including the 23 carrying *Bact. paratyphosum B* in the stools. No fresh cases developed, and of the contacts known to be carrying the infecting organism only one developed a mild pyrexia suggestive of an abortive attack.

It is an accepted fact that development of immunity, as indicated by the appearance of antibodies in the serum, does not begin for about five to six days after the first immunising dose, and is probably not appreciable for another seven to ten days; thus it seems scarcely credible that the sudden cessation of the epidemic can have been due to the inoculation. It is worth while comparing our experience with that of Ramsey (1935) who carried out similar inoculation of household contacts and compared the incidence of cases among this group with that in an uninoculated group. He found that the observed number of cases developing among contacts

who had received 3 doses of vaccine was only a quarter of the expected number, and that even in contacts who were still in the process of being immunised the reduction amounted to a half. He does not draw any conclusion from this latter result, on the grounds that the numbers concerned and the differences obtained are too small to be statistically significant. Our results also refer to small numbers and we have no control group with which to compare them, so that we also do not feel justified in drawing definite conclusions. Taken in conjunction with Ramsey's figures, however, it seems that even after the first dose of TAB there is a tendency towards a diminution rather than an increase in the incidence. Moreover, no ill effects analogous to provocation typhoid were produced by the immunisation. Even among the 23 contacts found to be carrying paratyphoid bacilli in the stools a few days after the first dose of TAB, only one developed the disease and that in a mild form.

Comparison of the incidence of carriers among uninoculated patients and inoculated subclinical cases shows that 3 of the 19 patients who were not inoculated, and 2 of the 23 contacts who received vaccine are still excreting *Bact. paratyphosum B*. It is therefore clear that while immunisation did not increase the incidence of the carrier condition, it certainly did not prevent it.

SUMMARY

An outbreak of paratyphoid fever in a closed community of 80 persons with exceptional opportunities for cross-infection is described.

All the contacts were immunised with TAB vaccine and this was followed by routine examination of fæces over several weeks.

The number of contacts who excreted *Bact. paratyphosum B* in the fæces without developing symptoms exceeded the number of clinical cases and formed a potential reservoir for the spread of infection.

Immunisation of patients after exposure to infection appeared to have no harmful effects and maypossibly have been a factor in the abrupt termination of the outbreak.

The carrier-rate was not appreciably influenced by immunisation.

We should like to thank Lord Stamp for his assistance with this work and the nursing staff for their help in collecting the specimens.

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BILATERAL CONGENITAL SUBLUXATION OF THE ACROMIOCLAVICULAR JOINT

JOHN GRIEVE, M B, B SC ST AND
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CONGENTIAL dislocations and subluxations in the region of the shoulder are not common; in fact only one example of congenital dislocation of the acromioclavicular joint appears to have been recorded, and Smith,[1] who reported it in 1870, was unable to find any genuine examples published before that date. The following two cases of bilateral congenital subluxation of the acromioclavicular joint were seen at recent air-crew medical examinations.

CASE-HISTORIES

CASE 1.—A man of 20. He had been a full-time breast-fed baby weighing 8 lb. at birth. The confinement was uneventful and the presentation vertex. He gave no history of serious illness or injury and said he had known for several years that his shoulders were more prominent than those of his fellows, and that he had felt self-conscious about them when bathing and swimming. He volunteered the information that his father was exactly the same and that he likewise had suffered no injury to his shoulders; unfortunately owing to war conditions it has been impossible to examine the father. His mother, brother and two sisters were fit and had no similar deformity. No abnormalities were known in preceding generations or in collaterals. He was of medium build and average muscular development. Casual inspection showed that some abnormal condition was present at the outer end of both clavicles. The outer end of each clavicle was 1·5 cm. above the acromion and overriding it by 0·5 cm. The capsule of the joint was lax and the clavicle could easily be moved in an anteroposterior direction, but less easily laterally. Reduction was almost complete but unstable. Movement at the shoulder was full and free both with a fixed and mobile scapula. It was not practicable to take a radiogram.

CASE 2.—A man of 18. He had been a full-time normal baby whose delivery was uneventful. He had sustained no injuries and said the ends of his collarbones had been prominent for as long as he could remember. Apart from an abscess in the region of his left elbow at the age of 6 years he had had no illness of note. His father, mother and two sisters were alive and well and no deformities were known in his family or in the collaterals. He was well built and of more than average height. The lateral ends of both clavicles were much more prominent than usual and were raised 1 cm. above the acromion, overriding it by 0·5 cm. Reduction was easy but unstable. Movements were full and he experienced no disability. The left fifth metatarsal was shortened and the small toe poorly developed. In all other respects he was apparently normal. The bilateral subluxation was confirmed radiographically (see figure).

Radiogram in Case 2.

DISCUSSION

The example of congenital dislocation of the acromioclavicular joint reported by Smith was in a macerated specimen of unknown origin in which the outer end of the clavicle was poorly developed, and in which the articular surface of the acromion was missing. The evidence for its congenital nature was circumstantial. In the cases here reported the evidence is again circumstantial but satisfactory. Even after repeated questioning of the first candidate, and in information supplied by his father in a carefully worded questionnaire, no history of antecedent trauma was obtained. It is most unlikely that any one could acquire a bilateral subluxation of the acromioclavicular joint without being aware of injury. Indeed, with the probability that the father has a similar condition (again without history of trauma) one might go even further and consider the possibility of heredity. The second candidate was equally emphatic that he had had no injury.

On several occasions, less definite examples of bilateral subluxation have been seen. In these the displacement was not more than 0·5 cm., but in each case there was definite evidence of laxness of the capsule of the joint. It seems therefore that some degree of laxity of the capsule is not so very rare, and may predispose to poor results in subsequent acquired dislocation or subluxation.

Experience has shown that in acquired subluxations and dislocations reduction is not essential for the full return of function, but the first patient showed that psychological ill effects of non-reduction are possible: thus he feels that he is not as other men and wonders how important this may be. It seems that, in treating subluxation and dislocation of the acromioclavicular joint, the cosmetic result is at least as important as the functional.

I wish to thank Dr. F. H. Kemp of the Radcliffe Infirmary, Oxford, for taking radiograms of the second candidate and the librarian of the Royal Society of Medicine for his help in trying to trace further examples.

1. Smith, R. W. *Dublin quart. J. med. Sci.* 1870, **50**, 474.

CORROSIVE PYLORIC STENOSIS WITHOUT ŒSOPHAGEAL INVOLVEMENT

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WE had the opportunity recently of studying a patient with pyloric stenosis due to corrosion as a result of drinking acid. The peculiar feature of the case was that there was no involvement of the œsophagus. The article by C. A. R. Schulenberg in the *Lancet* of Sept. 27, 1941 (p. 367), brought the rarity of this condition to our notice. Our patient showed much the same features as the one he described—no involvement of the mouth, throat, or œsophagus either of an acute or chronic nature, and the rapid onset of the stenosis.

A man of 36 had always been nervous, shy, and backward in company. Since 14 years of age he had been subject to depressive attacks. During these attacks he has had amnesic periods. In one attack, 4 weeks before admission to this hospital, he attempted suicide by drinking acid out of a battery. The only thing he could remember was that he had been violently sick afterwards. Ever since then he has had increasing thirst and inability to keep food down. On admission here he had the typical symptoms of pyloric stenosis: once a day he vomited large quantities of fluid. He was somewhat dehydrated. The X-ray report was: "Œsophagus: no evidence of constriction, no delay in passage of bolus of barium cream to stomach. Stomach: very atonic, attempt at peristalsis. After manipulation in supine position a thin stream of barium passed into the duodenum. Summary: extreme narrowing of the prepyloric area of the stomach with somewhat enlarged and atonic stomach."

After a few days on rectal salines and stomach lavage a posterior gastro-enterostomy was performed by Mr. A. M. Clark. Gross thickening of the pyloric region was found, the rest of the stomach appearing normal. He made an uneventful recovery.

Though the acid swallowed was probably not very weak—the acid in a battery is usually 28% H_2SO_4—it cannot have been long enough in contact with the rest of the alimentary canal to cause injury, but at the pylorus it was held up by spasm and was in contact with the mucosa long enough to cause serious corrosion.

We wish to thank Dr. W. J. Richard and Mr. A. M. Clark for permission to publish this case.

SPERM SURVIVAL IN RUBBER SHEATHS

JOHN TYNEN, R. M. RANSON

NOW that the collection in rubber sheaths of the seminal fluid of man and animals is becoming increasingly common, both for pathological investigation and for artificial insemination, the question of sperm survival in rubber sheaths is important. The object of this note is to emphasise the fact that the majority of sheaths now obtainable are toxic to human sperms, as measured by the time of survival of the sperms under standard conditions of storage. Owing to the war further supplies of the least toxic sheaths previously examined by one of us (R. M. R. *Lancet*, 1937, i, 1400) are no longer available in this country, for they were of Continental manufacture.

Experiments have been undertaken with a view to extracting the toxic substance from the sheaths now obtainable. Since it seemed obvious, from the rapidity with which sperms were killed by the more toxic sheaths, that the toxic substance was readily soluble in semen, initial attempts to extract this were made with isotonic solutions containing gelatin and egg-white, and having a pH value approximating to that of human semen. These solvents were found to be only very slightly superior to hot soap solutions as detoxicants. Various other solvents, such as ether, chloroform, &c. were tried with indifferent success. However, it was found that by soaking the sheaths in hot alkaline solutions of industrial spirit, the toxic action could be greatly reduced.

Samples of 17 popular brands of sheath were examined for toxicity both before and after washing with hot soap solutions or alternatively with hot industrial spirit containing ammonia. The mean survival-times of fresh human sperms maintained at 37° C. in the unwashed, soap-washed, and spirit-washed sheaths were 50, 86, and 140 minutes. When the sperms were stored for 15 minutes in the sheaths and then transferred to glass vessels the mean survival-times were 90, 160, and more than 360 minutes. Occasionally, sperms which had been stored for 15 minutes in a spirit-washed sheath and then transferred to a glass tube were found to be still feebly active at the end of 24 hours.

If, therefore, it is essential for pathological or clinical purposes to employ a sheath of minimal toxicity to sperms, it should be immersed for about 10 minutes in a mixture of about 200 c.cm. of industrial spirit and 10 c.cm. of dilute ammonia solution (*BP*) at about 50° C. The sheath should be turned inside out at least once during the treatment, at the end of which it should be rinsed with tap water, dried, and freely dusted with talc. The use of starch for dusting is inadvisable owing to the close similarity of the microscopical appearance of the granules to that of concretions occasionally appearing in semen, whence identification of the latter is complicated. The patient should be told to transfer the semen from the sheath to a glass tube as soon as possible.

It seems likely that the "fillers" and "accelerators" used in the manufacture of rubber sheaths are the source of the toxic action. Experiments with saturated saline solutions of mercaptobenzthiazole revealed the high spermicidal power of this substance, which is an example of the type of substance commonly employed in rubber vulcanising processes.

The chemical and biological work has been carried out in the Research Laboratories of the British Drug Houses Ltd., to the directors of which we are indebted for permission to publish this memorandum.

PERIPHERAL NERVE PALSIES FOLLOWING INTRAMUSCULAR INJECTIONS OF SULPHONAMIDES

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THE object of this communication is to draw attention to the serious damage which may result from the intramuscular injection of sulphonamides in the close neighbourhood of peripheral nerves. Three such cases have come under my observation.

CASE 1.—A healthy young man contracted meningococcal meningitis and was removed to hospital. The attack was typical and of moderate severity and he received a full course of sulphapyridine, partly administered by intramuscular injection of the diluted sodium salt into alternate buttocks. In all 7 injections were given. Seven days later it was observed that he was unable to move his right foot, which together with the lower part of the leg was numb. He has no recollection of the first five days after admission to hospital. He was discharged from hospital 8 weeks after admission. When examined a fortnight later he showed signs of complete loss of function of his right sciatic nerve. There was moderate wasting and complete loss of voluntary power in the lower part of the biceps femoris and of all muscles below the knee. The ankle-jerk was lost and there was complete sensory loss in the distribution of the sciatic nerve in the foot and leg. The skin of the foot was dry and atrophic. At about the level of the junction of the middle and upper thirds of the thigh (5 in. below the great trochanter), a little lateral to the line of the sciatic nerve, one could feel an ovoid mass about 1½ in. long and 1 in. wide. Pressure on this produced neither local discomfort nor referred sensations in the foot. There has been no recovery in six months.

CASE 2.—A previously healthy man was admitted to a hospital on account of an infected blister on the right heel. He was critically ill and in addition to local treatment to the foot an intramuscular injection of sodium sulphapyridine was given into the outer aspect of the right arm. Two days later it was observed that he had right wrist-drop. When examined 6 weeks later he had signs of a complete radial nerve palsy. Apart from all three heads of the triceps, all muscles

supplied by the radial nerve were wasted and completely without voluntary power. There was slight impairment of sensation along the radial border of the forearm and hand. No recovery has occurred in six months.

CASE 3.—A previously healthy man was wounded in the left arm by a bomb splinter. On reaching this country 2 days later an immediate operation was performed on his arm, which had become heavily infected. As far as can be ascertained from his records, he received injections of sodium sulphapyridine and he says that at least one injection was given into the left buttock. The day after the operation on his arm the left leg was found to be powerless below the knee, having been normal in all respects before. Nine months later the signs indicated a severe partial lesion of the left sciatic nerve. There was complete loss of power with severe wasting in all the muscles of the anterior and lateral compartments of the left leg, with weakness of the flexors of the ankle and toes. Sensation was severely impaired on the dorsum of the left foot and the outer aspect of the lower third of the leg, but there was no area of complete loss. Electrical examination showed complete reaction of degeneration in the anterior tibial muscles. This patient's progress has been followed and the signs have not changed in 15 months.

In cases 1 and 2 the physiological interruption of the nerve was complete and in case 3 very severe. In no case has any evidence of recovery shown itself at present. In cases 1 and 2 the damage can be attributed with almost complete certainty to the drug, which in these cases was sodium sulphapyridine. In the third case it is not possible to be quite so certain, as the hurried notes made at the time indicate that in addition to sulphapyridine sera were also administered by injection.

The practical conclusions to be drawn appear to be (1) that sulphonamides should only be administered by intramuscular injection when the oral route is impracticable, (2) that they should then be administered only by a medical man, (3) that they should be given into muscles as remote as possible from an important peripheral nerve—e.g., into the vastus externus, and (4) that the most rigid asepsis should be insisted on, the instruments being boiled rather than sterilised by chemical agents.

Reviews of Books

Cancer of the Uterus

ELIZABETH HURDON, CBE, MD Toronto, first director of the Marie Curie Hospital, London, and late associate in gynecology, Johns Hopkins University. London: Humphrey Milford, Oxford University Press. Pp. 187. 17*s.* 6*d.*

THIS book, published after its author's death, is a record of her unique experience and remarkable clinical judgment; it is besides a standard textbook on cancer of the uterus based on fourteen years' work in a clinic which has produced some of the best results ever obtained in the treatment of this form of cancer. A table showing local cures in relation to grade and stage of the disease suggests that the histological grade is of little significance—a point which Dr. Hurdon emphasised. Clinical observation has shown that the stage of the disease is all-important, and that delay in treatment is a serious mistake. In a chapter on general clinical techniques she passes on information obtained by careful observation over many years. A special chapter deals with dosage calculation and distribution. Prof. W. V. Mayneord, working with her, measured the radiation obtained from the intracavity applicators used at the Marie Curie Hospital. Dr. Hurdon found it desirable to pack the applicators well up into the lateral fornices; satisfactory dosage depends on getting the radium in good position. It is unfortunate that there was not time for another study of the dosage in more advanced cases where ideal arrangement is impossible but where nevertheless some remarkable five-year cures were recorded. Remaining chapters cover treatment of complications, results of treatment, and other malignant conditions including sarcoma of the uterus, cancer of the vagina, and cancer of the vulva. The section on results is impressive; the five-year survival-rate of 36% of all cases treated sets a standard for other radiotherapists.

Reception of William Beaumont's Discovery in Europe

Dr. GEORGE ROSEN. London: Baillière. Pp. 97. 38*s.* 6*d.*

Dr. Rosen feels that few have estimated the interest roused in Europe by Beaumont's work on gastric secretion, and has set himself the task of filling the gap. At the time of Beaumont's work an active dispute about the facts was in progress on the Continent, especially in Germany, where accepted hypotheses were being examined afresh. Beaumont's work was enthusiastically received there, even before the publication of his book. The leading German physiologists quickly realised the importance of the work, and in England the new ideas were welcomed soon afterwards; but curiously little interest was displayed in France for several years. With the general acceptance of the newer teaching founded on Beaumont's work his name, as Dr. Rosen shows, disappeared from the records, and it was not till the beginning of this century that Beaumont's reputation as an original researcher was revived. He was worthy of recognition, as the records of his life and of the extreme accuracy with which he planned and recorded his experiments show. Some of his conclusions were mistaken, but the main facts he established have stood the test of time.

Immunology

(2nd ed.) NOBLE PIERCE SHERWOOD, MD, PhD, FACP. London: Henry Kimpton. Pp. 639. 33*s.*

THE appearance of a second edition six years after the first suggests that this book has had moderate success, although medical students for whom it was intended will find it hard reading. The text suffers in places from over-compression, and the relative importance of statements of fact is not always indicated; Professor Sherwood's own conclusions should be more in evidence. Paragraph headings have been improved in this edition and are useful for ready reference. Advanced workers should benefit from a perusal of chapters dealing with their own specialty, but will be surprised by the inclusion of much obsolete material and by strange omissions; for example, no mention is made of the work of Todd on streptolysin, nor of Burnet, Bigger, Dolman and others on staphylococcus toxin and antitoxin. A more critical account is required of diphtheria prophylactics, and Schick-test toxin should have been defined in terms of combining power and not of guineapig MLD. Hypersensitiveness and the chemistry of antigens are well summarised. The book is attractively produced and is recommended to supplement but not replace other volumes on immunology. At the end of each chapter are long and valuable lists of references.

Binocular Imbalance

MARGARET DOBSON, MD Lond. London: H. K. Lewis. Pp. 96. 10*s.* 6*d.*

SINCE Claud Worth classified the degrees of binocular vision, from simultaneous macular perception to full stereoscopic vision, increasing attention has been paid to the ocular muscles and their relation to eyestrain. As Miss Dobson points out, experience has shown that of all causes of eyestrain that lie with the external ocular muscles, the commonest is convergence weakness. Whether man was intended to spend 8 hours a day at close work is a matter for argument, but there is no doubt that doing so calls for a sustained muscular effort which at times taxes him severely. Miss Dobson gives an account of the causes of eyestrain other than those due to errors of refraction, and there is much useful information in her book. Eye exercises have become the vogue and are expected to cure anything from myopia to cataract. This book gives a restrained account of the help that may be gained from them. The intimate association between convergence and accommodation is well explained and there are some useful hints for those prescribing glasses for presbyopia. Not many oculists will agree that all manifest hypermetropia must necessarily be corrected for distant wear; Miss Dobson has had her defeats over it, seemingly, for she says, "it is frequently difficult to assure patients that this is necessary as slightly blurred vision is so well tolerated." The information conveyed in this book is not always easy to extract and a more concise definition of some of the terms used would have made for easier reading.

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THE LANCET

LONDON: SATURDAY, OCTOBER 10, 1942

RICKETS IN THE BREAST-FED BABY

A MOTHER in the *Nursery World* for Sept. 10 is worried because her baby at the age of 18 months has been admitted to hospital for the treatment of rickets, despite the fact that she suckled him for 9 months and later included halibut oil in his diet. Is it something lacking in war-time diet, she asks, and goes on to suggest that hers is a common problem. If so, practitioners will be asked about prophylaxis. This mother says her son's legs were bandy as soon as he began to walk, but a certain amount of bandiness is a normal phenomenon, and in chubby babies the muscle bellies of the legs give an erroneous idea of the shape of the bones. Careful X-ray examination with soft rays will reveal in many instances perfectly straight bones, although the soft parts look unnaturally curved.[1] So radiological diagnosis is essential to establish the presence of rickets, and orthopædic surgeons are perhaps too ready to ascribe bow legs and knock knees to rickets. The next point concerns breast milk and its vitamin-D content. This must depend largely on the mother's diet and state of health, and breast-feeding by no means excludes the risks of rickets. Indeed, experience in places where rickets was rife indicated that when rickets does arise in the breast-fed it is likely to be severe. But rickets does not seem to have become unduly prevalent since the war began, and in this particular case the mother lived in the country and her diet was said to be generous, containing milk, eggs and vegetables. The mother does not mention her vitaminised margarine, a most valuable source of vitamin D for her and indirectly for the baby (60 IU per oz.), but even with this the findings in Australia mentioned in these columns[2] a few weeks ago suggest that the expectant mother in good hygienic and dietetic circumstances needs extra vitamin D as well as extra calcium if her baby is to be fortified against rickets. The third point is that rickets is a disease of growing bones, and the more rapid the growth the greater the chance of rickets. Thus arises the paradox of the breast-fed baby who is doing exceptionally well on his diet and growing so fast that even a normal ration of vitamin D is not enough for him. In other words, the total amount of vitamin D available in his mother's milk daily is, in relation to his size and growth, relatively deficient. It is just this over-fed, contented, fat baby who not only looks bandy when he gets on his legs but because of his rapid growth and over-weight condition may actually develop some bending of his relatively poorly calcified bones. If he had not done so well on the breast he might not have been bandy! *Large* doses of cod-liver oil, at and after the time of weaning, may make matters worse by encouraging too rapid growth. The remedy is twofold. First, see that expectant mothers take vitamin D in adequate amounts and really drink their pint of milk daily during the last three months of pregnancy, and that they do not give them up while they are suckling the baby. Secondly, see that every breast-fed baby gets some cod-liver oil, or its equivalent, right through the rickety period—up to 2 years. Start with a few drops daily at a few weeks old and work up steadily to 30–45 minims a day at 6 months, when mixed feeding begins. The increase should continue, aiming at 60–90 minims at a year old. Certain modifications in this programme may be permitted. In summer the baby under 6 months can do with less cod-liver oil, but after that age the demands for vitamin D are so great that it is risky to reduce the dose much. The over-weight baby needs special care, and whenever possible a vitamin concentrate is better than cod-liver oil for him.

1. There is a good photograph of this in the last edition of Hutchison's lectures on Diseases of Children (page 161).
2. *Lancet*, Aug. 8, 1942, p. 163.

THE AMPUTEE'S POINT OF VIEW

THE unshapely artificial limb that a Syme's amputation necessitates has been advanced, especially in the case of a woman, as an argument in favour of the below-knee amputation.[1] WHEELER,[2] having seen excellent and lasting functional results with the Syme amputation, urges that it is up to the instrument maker to fashion a more shapely limb, and considers that the average woman would ignore reasons of show for the sake of the more stable, useful stump. A woman who has had first a Syme and then a below-knee amputation done does not agree. Ten years ago, when at the age of 18 she had a Syme for a badly crushed foot, she was at first appreciative of her surgeon's conservatism, but she soon regretted that her stump did not allow a natural looking foot to be fitted; her thick ankle and limited motion at the joint made it obvious that she had an artificial foot. She could walk all day and dance as much as she liked, but she could not dance properly or wear dancing slippers. In a blitz her leg was burnt badly enough to necessitate re-amputation through its middle, and when her below-knee artificial leg was fitted she was delighted to see herself in the glass standing on two normal and evenly shaped legs. Now people no longer realise that she has an artificial leg; she can walk as well as she did with her Syme and dance better in proper shoes; but above all she is no longer labelled a cripple.

Limb-fitting surgeons have given much consideration to the emotional outlook of amputees, and they have been divided into three groups by an American committee, composed of surgeons and limb manufacturers, who have recently issued an admirable handbook on amputations.[3] First, there are those whose amputation is performed for chronic diseases, such as bone infection, vascular insufficiency or malignant disease. These accept their loss as a blessing and a welcome escape, and are content with any form of prosthesis, even though it be unshapely or ungainly. In a second group a planned re-amputation is done to enable a more becoming and useful prosthesis to be fitted. The woman whose opinion has been quoted comes in this category. These are the most gratifying patients of all for the surgeon—they look forward to the operation, plan, and are eager to start life afresh. In the last group are those recently mutilated by accident or warfare. Here, the healthy patient must suddenly realise that he will have

1. See *Lancet*, Aug. 8, 1942, p. 159.
2. Wheeler, W. I. de C. *Ibid*, Aug. 29, 1942, p. 265.
3. Handbook on amputations. By a joint committee of the American Medical Association and the Association of Limb Manufacturers of America. Chicago: American Medical Association. 1942. Pp. 82.

to go through life maimed and must re-shape his future accordingly; often there is the suppressed horror of possible disfigurement. Ultimate adjustment will depend partly on the patient's natural emotional stability, partly on the mental atmosphere of his convalescence. The busy surgeon may forget that the stump is but part of the whole. The nursing staff display the sympathy which every amputation evokes, but as the American committee point out such sympathy must not be misplaced, and any tendency to molly-coddling must be curbed. It is important at an early stage for the patient to regain the ambition to embark on his new life. Stories of what others have thought and achieved under similar circumstances will encourage and stimulate him. Six years ago a man who at the age of 34 had reached the forefront of chest surgery pricked his finger in the theatre, infected it later when doing a dressing and had to have an amputation high up through the arm. As he woke from the anæsthetic his first words to his wife were, "Now we shall just have to start all over from the beginning again." H. P. NELSON died soon afterwards but his is an outlook on life which many a man will be wise to adopt.

At Roehampton, by teaching and precept, they make the patient realise that he is not to be dependent on others and must not regard himself as a cripple. If others are not so to regard him he must both walk normally and look normal; that is why the Roehampton surgeons urge that, although they can fashion a limb to fit any type of stump, amputations must be done at the sites they suggest. It is odd that amputees are so often anxious about the look of the lower limb prosthesis, and yet the arm amputee discards it at the first opportunity, prefers to walk about without an apparatus, and rarely attempts to conceal the disfigurement. The Roehampton authorities say that the upper limb should be fitted at the earliest possible moment—usually six weeks—or the patient will learn to do without it. For the child too they have laid stress on the importance of early fitting; otherwise as he plays with other children he regards himself as different—a cripple. Lower limbs for the child are now so made that they can be easily lengthened, and the child will become particularly adept and proficient with an artificial leg or arm, providing it is early accustomed to its use.[4] If the stump is not used till adult life it "loses its place" in the brain. Early use of the stump is as important for the adult, and progress will only come if the amputee is keen and anxious to get back to a job. The patient has to work if he is to learn to balance, to swing, to walk and to look normal. JEAN CAMUS wrote in the last war: "Physiotherapy cannot be prescribed as quinine is prescribed. The malarial patient who takes the latter medicine benefits whether he wishes to or not. The wounded man who submits each morning to his mechanotherapeutic treatment does not recover unless he wishes." We can foster that wish, and A. T. LYALL, writing in the *Spectator* (Sept. 25), points the way. Industry must take a hand, he says, and every employer must consider it his duty, not charity, to train and to place the disabled. Man succeeds best when he does the work his heart desires most. To train the disabled miner to be a cobbler or a basket-worker is to batten down his spirit to succeed. The maimed agricultural labourer must be returned, if at all possible, to his first love, the welder to his trade, the clerk to his desk, and those that would be doctors it should be our function to encourage and support during their training. The employer will be well rewarded if it is "with savage determination" that the cripple strives to keep apace—even ahead—of his fellow men.

4. Langdale-Kelham, R. D. and Perkins, G. Oxford War Manual on Amputations and Artificial Limbs. London. 1942.

MAMMALIAN BIRTH

ONE of the curious gaps in our knowledge is that concerning the phenomenon of birth. The mechanical aspects are the essence of obstetrics, just as the anatomical development of the fœtus is the essence of embryology. But the how and wherefore are only now coming to be understood as a result of the pioneer work of BARCROFT and his colleagues at Cambridge[1] and of BARCLAY and his colleagues at Oxford.[2] As a result of the close coöperation of these physiologists and radiologists it has not only been possible for the first time to observe the circulation in the intact fœtus by means of X-ray cinematography, but to understand at least some of the processes which come into play during mammalian birth. All these observations have been made on the sheep, but their application to man should be comparatively easy.

In the sheep, whose period of gestation is 147 days, the placenta reaches its maximum weight at the 100th day, despite the fact that the fœtus is then only one-eighth of its size at full term. Although the volume of the fœtal capillary bed in the placenta remains constant during the last third of pregnancy, adequate oxygenation of the fœtus is maintained by its rising arterial pressure from the 100th to the 130th day and by an increase in the hæmoglobin during the last fortnight. So far as oxygen supply is concerned, as BARCROFT neatly puts it, the fœtus at the 80th day is living at the level of Mont Blanc, by the 130th day it has passed the Andean level, at birth it is under Mount Everest conditions. The fœtus as it grows to maturity suffers like the mountaineer from an increasing degree of oxygen want; unlike the mountaineer it cannot meet that situation by panting. How far it can be said to acclimatise is not known. At birth the blood in the placenta is transferred to the fœtus by contraction of the umbilical and placental vessels, and possibly in man by contraction of the uterus; this overloading of the fœtal circulation is not to supply the newly functioning lungs, which are indeed already vascularised, but to provide a store of iron to see the infant organism through the first few months of life when its intake is inadequate. The extra corpuscles are soon broken down and their iron is stored in the liver. The closure of the umbilical vessels when the cord is ruptured seems to be brought about by their own contractility, particularly at the level of the umbilicus itself.

The circulation and the cardiovascular system in the mature fœtus are much the same as at the 100th day, the main difference being a well-marked fall in the relative weight of the liver which declines from 11% of the body-weight at 69 days to less than 3% at 140 days. A remarkable feature of the fœtal circulation

1. Barcroft, J., Barron, D. H., Kennedy, J. A., Mason, M. F. refs. in *Lancet*, 1941, ii, 91; 1942, ii, 117.
2. Barclay, A. E., Franklin, K. J. and Prichard, M. M. L. *Brit. J. Radiol.* 1942, 15, 249. See also *Ibid*, 1939, 12, 505.

is the method whereby maximum oxygenation of the heart and brain is maintained. The blood entering the heart through what BARCLAY and his colleagues describe as the inferior-posterior caval channel flows mainly through the foramen ovale to the left side of the heart and thence enters the first part of the aorta, thus supplying the heart and the brain. The blood entering the heart through the superior-anterior caval channel passes in its entirety to the right side of the heart and is thence distributed (together with the smaller fraction of the inferior-posterior caval flow, and the coronary venous return) in part to the pulmonary arteries and in part, via the ductus arteriosus, to the descending portion of the aorta—i.e., it enters this vessel distal to the offshoots supplying the heart and the brain respectively. The advantage of this arrangeis obvious; the more highly oxygenated blood from the placenta goes direct to the heart and the brain, while the rest of the fœtal organism, whose demands for oxygen are much less stringent, is supplied principally by blood which has already made a cardiac or cerebral circuit. The two outstanding problems of the closure of the ductus arteriosus and of the foramen ovale have also been clarified. Both are closed within a few minutes of birth, the latter probably closing first; the right group of pulmonary vein entries shares with the foramen ovale an opening into the left atrium, so the inflow through the former can increase only at the expense of the inflow through the latter. The functional closure of the foramen ovale may, therefore, be related to increase in the pulmonary venous return. In the newborn lamb, delivered by cæsarean section, the ductus arteriosus remains patent so long as the placental circulation is effectively maintained. When, however, the umbilical cord is tied there is a complete change, for within a few minutes the ductus is functionally closed, and in a healthy subject it does not thereafter reopen. The time relations of the closure are, therefore, those of a sphincter and not those of cicatrisation. The rapid physiological closure is followed by the very gradual conversion of the muscular sphincter into connective tissue.

The problem of the first breath has been at least partially solved. The essential neuromuscular mechanism for this act is already laid down, in the sheep, between the 34th and 50th day of gestation. From this early stage, when the respiratory movement is the result of a reflex arc consisting of the maxillary branch of the trigeminal nerve, cells in the reticulospinal tract, and the spinal accessory and upper cervical ventral nerve-roots, there is a gradual transition as the higher centres develop and inhibit the lower centres. At birth two main factors come into play—partial asphyxia due to suspension of the placental circulation, and multiple stimuli from the skin due to the removal of the fœtus from its non-stimulating environment of amniotic fluid to the external world. These two factors are undoubtedly the major ones, though whether oxygen want or excess of carbon dioxide predominates is still undetermined. Such, in brief, is the story up to date. Some of it was known before; much of it was suspected, but it is only now that proof has been provided. The progress made in such a short period as 5 years justifies the hope that we may at last really understand the physiology of birth, and secure a foundation for the proper handling of the beginnings of life. This is in its nature essential work.

WOUNDS AND FLAVINES

THE war has naturally brought a great revival of interest in the local treatment of wounds. The work has been divided into three main parts—the prevention of hospital infection, the application of prophylactics, and the treatment of established infection. Apart from the widespread use of the sulphonamides as local applications, both in prevention and in treatment, interest has been revived in the hypochlorites by BUNYAN,[1] and in the group of acridine dyes exemplified by acriflavine and proflavine. These dyes have had many protagonists and many antagonists. For example, FLEMING,[2] marshals the evidence against acriflavine, pointing out that 80% of the dye is absorbed from a 1 in 1000 solution by dressing gauze, and that it has a powerful inhibitory effect on the bactericidal power of blood at a concentration of 1 in 270,000 if allowed to act on the blood for four hours before the test inoculum of bacteria is added. JACOBY, MEDAWAR and WILLMER[3] found that proflavine was intensely toxic to fibroblasts in tissue culture, causing an irreversible inhibition of mitosis at concentrations of less than 1 part per million, and might thus be expected to interfere seriously with healing. GARROD[4] however expressed the view that the undeserved contempt for antiseptics which is now so common is largely based on beliefs which arose during the last war, when the almost universal judgment on experiences with casualties in France was that antiseptics had failed, and he considers that because of its constancy of composition, minimal toxicity and relative cheapness, proflavine is the antiseptic of choice.

Proflavine is 2 : 8-diaminoacridine sulphate and it has some promising relatives. In 1934 ALBERT[5] began the synthesis of a series of acridine compounds, and his work led to the discovery of 2 : 7-diaminoacridine, which is as powerful an antiseptic as proflavine and acriflavine, yet has only a tenth of the toxicity of acriflavine for mice.[6] Unfortunately, 2 : 7-diaminoacridine is difficult to make in quantity and has not been generally available, but ALBERT[7] is said to have overcome that difficulty. RUSSELL and FALCONER[8] investigated the histological effects of acridine compounds, coal tar derivatives, halogen compounds, organic mercurials and 'Soluseptasine' on rabbit brain. They found that acriflavine, like most other antiseptics, caused hæmorrhage and necrosis, but that proflavine was little more harmful than isotonic saline solution, with 2 : 7-diaminoacridine hydrochloride not significantly different, so they recommended the use of proflavine sulphate as a 0·1% solution in isotonic saline buffered to pH 6·3. MANIFOLD[1 9] investigated the effect of a similar series of antiseptics on the respiration of brain tissue, and found that acriflavine was highly toxic, even at very low concentrations, while proflavine was much less toxic, and 2 : 7-diaminoacridine hydrochloride significantly less toxic than

1. Bunyan, J. *Brit. med. J.* 1941, ii, 1.
2. Fleming, A. *Proc. R. Soc. Med.* 1940, **33**, 487.
3. Jacoby, F., Medawar, P. B. and Willmer, E. N. *Brit. med. J.* 1941, ii, 149.
4. Garrod, L. P. *Lancet* 1940, i, 798 and 845.
5. Albert, A. and Linnell, W. H. *J. chem. Soc.* 1936, p. 1614.
6. Albert, A., Francis, A. E., Garrod, L. P. and Linnell, W. H. *Brit. J. exp. Path.* 1938, **19**, 41.
7. See Manifold, M. C. *Ibid*, 1941, **22**, 111.
8. Russell, D. S. and Falconer, M. A. *Proc. R. Soc. Med.* 1940, **33**, 494; *Brit. J. Surg.* 1941, **28**, 472.
9. *Proc. R. Soc. Med.* 1940, **33**, 498.

proflavine. Acriflavine was always preferred by dispensers, who found it easier to dissolve than proflavine, but as normally prepared acriflavine consists of a mixture of the hydrochlorides of 2 : 8-diaminoacridine and 2 : 8 diaminomethylacridinium and may vary considerably in different samples, while proflavine is as good an antiseptic, many times less toxic, and of constant chemical composition.

On another page MITCHELL and BUTTLE, working with the Middle East Force, describe the results of applying proflavine as a powder to infected wounds in amounts ranging from 0·25 g. to 2·0 g., but usually of 0·5 g. or less, never more than three times, at intervals of 4–28 days. In their series of 80 cases the powder was often strikingly successful when other methods had failed. Neither toxic manifestations nor delayed healing were seen, and they say that where staphylococci are the infecting organisms, proflavine powder has proved more efficient in controlling or eliminating infection than any other drug so far tried. Probably the drug is here being effectively used for the first time. The introduction of the powder directly into the wound seems to be more logical than the time-honoured method of laying on, or lightly packing in, a piece of gauze wrung out in a 1 in 1000 watery or oily solution, of which over 80% will be retained by the gauze. Proflavine is soluble to 0·3% in saline,[6] and presumably this concentration is approached in the superficial layer of the wound, while 2 : 7-diaminoacridine hydrochloride is soluble to 0·4%, and appears to be even more promising. Many of the other members of this series of compounds, though soluble in water, are precipitated in physiological saline, so despite their interesting properties they are not suitable for use in vivo.

Annotations

DRAGON'S TEETH

AN hour or two before his death at the beginning of 1941 Varrier-Jones wrote to Sir Walter Langdon-Brown describing a scheme that had taken hold of him to have a course of lectures at Papworth on the diagnosis and treatment of tuberculosis. The scheme, with change of venue but not of purpose, has materialised as his memorial, and on Sept. 25 Langdon-Brown paid just tribute to the man and the idea before Wing-Commander Trail delivered the first Varrier-Jones lecture at Halton (see p. 413). He retold the story of how Papworth settlement, which today has 500 acres of land, 100 cottages and factories with annual sales running into six figures, grew from one patient put as an experiment in the charge of a capable nurse in the village of Bourn. Varrier-Jones, with his peculiar blending of medicine, economics, and sociology had, he said, changed occupational therapy into therapeutic occupation, and today when tuberculosis is once again increasing its inroads we should do well to reflect on this vision—which, as Trail later pointed out, Varrier-Jones had known how to reduce to theory and establish in practice. Pendragon was the apt name given to Varrier-Jones by his contemporaries; his followers are harvesting not mutually destructive giants, but revivified citizens.

HEALTH OF THE WAR WORKER

THE efficiency of war workers depends on their physical and mental health as well as that imponderable quality called morale. The workers themselves are taking an interest in the factors in their environment which affect their health and efficiency, and a pamphlet[1] for their information, published by the Labour industrial health committee, is timely. Prepared with the help of the Socialist Medical Association this deals with factory hygiene, food, clothing and transport, accidents, hours of work and factory medical services; the last section suggests how workers themselves can help to tackle health problems in factories. If they are exhorted rather more freely to "insist" on safeguards and "demand" information than the conscientious employer would think necessary, it must be borne in mind that not all employers are conscientious; and that men and women still can and do lose life or health from carelessness on the part of the management, as reports of prosecutions show. Thus workers are advised to insist on a full report, either from employers or from the factory inspector, on fumes and dust in their working atmosphere. Spacing of workers is well discussed and they are told that a barrier of glass or mica between those working face to face at a distance of a foot or two will help to prevent the spread of colds or influenza and thus the loss of many weeks of work. The pamphlet notes that lavatories in factories are often ill-lit, rarely painted and have defective flushes or cracked pans. Hand-basin, soap and towels may not be conveniently placed for washing after the use of the closet. In such cases workers are advised to ask the management for better equipment, and also to make sure that they themselves conform to the standards they would require in their own homes. They are reminded of the great importance of washing facilities, since much industrial disease can be avoided if the skin is kept clean. They are advised, too, about detergents, and warned that turpentine, benzene and other strong cleansing agents may themselves cause dermatitis. Under the Factory Act women who work standing are entitled to a seat for use when opportunity offers. This may come as a surprise, the pamphlet suggests, to many of them, and adds with realism that in scores of factories "this section is just a bad joke and is bound to remain so"; but the principle of periodic rests is sensibly explained, and workers are reminded that the clever worker, like the clever footballer, saves himself when he can. Output goes up when everyone is made to have a rest pause. The comfortable height for a work bench was estimated by the Industrial Fatigue Research Board in 1927, and the figures are given again here—38 in. for a man and 37 in. for a woman. It seems astonishing that this, too, should not be common knowledge or even common practice. The section of the act requiring the management to provide a separate room in which employees working with lead, arsenic or other poisonous substances can take their meals is difficult to enforce because workers themselves are apt to be casual about the danger; for the same reason it is sometimes difficult to get them to make use of protective clothing. The pamphlet puts the case for proper precautions clearly and wisely, and suggests that employers should be made to provide protective clothing outside the list of trades where it is now compulsory. For example, it seems that many of the 15,000 serious accidents to toes of workers yearly could be avoided if boots with reinforced toe-caps were provided for those handling weights. Transport difficulties are still hindering production and adding to the fatigue of those already working long hours, and trade unions are advised to take their complaints to the regional production boards. Many accidents could be avoided by proper training of new workers; any firm under the Essential Works Order can be required by the Ministry of Labour to provide an adequate training scheme for new entrants, and workers are advised to see that this is done. They are also encouraged to form safety committees, run by

1. Health of the War Worker. London: Labour Research Department, 6, High Holborn, W.C.1. 1942. Pp. 40. 6d.

the trade union organisation, to supervise and improve safety devices, by way of supplementing the work of the factory inspectors, who are nowadays kept very busy. The sections of the pamphlet dealing with eye injuries, hours of work, weight-lifting and compensation for injuries are all instructive. The compensation section could usefully be issued as a leaflet to each worker, for cases still arise in which an injured man gets no compensation because no-one has told him how to apply for it. The Factories (Medical and Welfare Services) Order is felt to be only a first step towards an efficient medical service, and the pamphlet objects that the doctor appointed is chosen entirely by the management and that there is no Government supervision of the way he does his work. The Ministry of Labour, however, has published a memorandum on the duties to be expected of a factory doctor, which we reviewed last week (p. 405). The Industrial Welfare Society has lately revised its booklet [2] on health services in industry; unlike the LRD pamphlet it is addressed mainly to employers. The society asks how many panel doctors have been inside a factory or know the conditions in which their patients spend much of their lives. There are, in fact, probably about 1700 general practitioners acting as factory surgeons, as well as some 500-odd who have lately been appointed as part-time medical officers to factories. The doctor best fitted to treat the patient is the one who knows his environment both at home and in the factory. General practitioners might well be appointed freely as part-time officers to one or more smaller factories, and small firms might combine for the purpose.

A REGIONAL ADVISORY COUNCIL GETS TO WORK

IN theory regionalisation is much favoured by the planners of today. In practice it seems to have made a good beginning on Tyneside. The North-Eastern Regional Hospital Advisory Council, which meets under the chairmanship of Lord Eustace Percy, is self-styled a "purely advisory and consultative body," but its first annual report shows that not only has it established the machinery for future discussions but it has set those responsible for the health services of the region some searching questions, and seems to be in a fair way to getting the answers. Indeed, clouds of careful questionnaires are being broadcast. For instance, by arrangement with the MRC and the Nuffield trustees, Dr. A. Q. Wells, reader in pathology in the University of Oxford, has spent several weeks in the region and on the basis of his own observations and on questionnaires completed by the local people concerned he has submitted a report on the pathological services to the council. Questionnaires on the hospital facilities available have also been set to the local authorities and to the voluntary hospitals, while the accident service subcommittee have yet another questionnaire now ready for circulation on the fracture services of the region. Another side of the council's work is shown by the help it was able to arrange for the Durham County Hospital which during the last years has been faced with a growing burden of debt. The hospital applied to the council for help and advice and after investigation the council recommended that the Nuffield Trust should make it a grant on condition that a contributory scheme was at once begun. The satisfactory result is that the trustees have agreed to give the hospital £5000 over the next three years and the new contributory scheme already has a membership of over 20,000 and an income of about £10,000. The council is an expression of the common responsibility of the local authorities and the voluntary hospitals to provide hospital services for the people, and it seems to have made a flying start in promoting coöperation, preventing duplication and putting its finger on deficiencies.

2. Health Services in Industry. London: Industrial Welfare Society. 1942. 2s. 6d.

EXPERIMENTAL LIGHT ON CRUSH SYNDROME

THE investigation of trauma in man is made difficult not only by circumstances of time, place and enemy action but also by the multiplicity of insults. Thus fright, exposure, hæmorrhage, soft-tissue damage and fractures often occur together in the one patient, as well sometimes as the rarer type of injuries such as blast. The special advantage of animal experiment over clinical observation is that a single factor may be isolated and studied. In contrast to many producers of what is loosely known as "experimental shock," Duncan and Blalock [1] in two recent papers have confined themselves to one main factor—soft-tissue damage—in an attempt to reproduce in dogs the analogue of crushing injury in man. The limb was clamped between wooden boards at a pressure of 500 lb. for five hours under 'Pentothal Sodium' anæsthesia; after release, all but one animal died from "shock," due, as in man, to loss of plasma from the blood-stream into the injured area. This mortality could be greatly reduced by enclosing the limb immediately after release in a rubber cuff inflated to a pressure of 40 mm. Hg. A similar but slightly smaller reduction in mortality due to shock was produced both by transfusion of plasma and by keeping the limb at a low temperature during crushing. It may be noted that only 33 ml. of plasma per kg. body-weight was given over a total period of two hours. In man, more than this is often required, and over a longer time, if death from shock is to be averted. In human crush injury the cause of death is usually, therefore, renal failure, and it occurs not on the first but on the sixth or seventh day. In those of Blalock's dogs surviving the shock-period, fatal renal failure unfortunately did not appear. Oliguria, gross hæmaturia and casts were seen, together with some azotæmia. Urinary creatine and creatinine but no urea figures are given; hence we can only assume that this azotæmia was due to nitrogen retention. Nor is it possible to compare the effects of therapeutic compression with those of plasma transfusion on the blood non-protein figures, as these are not given for the former group. Thus the comparative effects of compression and transfusion on the development of renal damage still remain to be evaluated.

Since the human condition is superficially similar to that of mismatched transfusion kidney, in which alkalinisation of the urine is thought to be entirely preventive of renal failure,[2] this seems the treatment to be first tried. That has not yet been adequately done; the alkali had been given in too small a dose to change the urinary reaction or too late to affect the result, or the case has been so mild that recovery could already have been forecast. More experimental work, on the renal aspect particularly, is badly needed. Meanwhile Patey and Robertson [3] maintain that the crush syndrome arises from loss of blood constituents into the injured limb, while the isolation of myohæmoglobin from the urine of five of these patients by Bywaters and others [4] seems to point to substances proceeding from the injured limb being important in the genesis of renal failure. On the first of these views Patey and Robertson [5] suggest that the crushed limb should be treated by intermittent positive pressure and tight bandaging to *promote* the absorption of œdema fluid and prevent its formation, while on the second view Curphey [6] advocates tight bandaging or tourniquet to *prevent* the absorption of œdema fluid and of the hypothetical kidney-toxin it picks up from damaged muscle. As Duncan and Blalock remark, "further studies are indicated," and they are needed in man as well as in animals.

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2. Baker, S. L. and Dodds, E. C. *Brit. J. exp. Path.* 1925, **6**, 247.
3. Patey, D. H. and Robertson, J. D. *Brit. med. J.* 1942, ii, 212.
4. Bywaters, E. G. L., Delory, G. E., Rimington, C. and Smiles, J. *Biochem J.* 1941, **35**, 1164.
5. *Lancet*, 1941, i, 780. 6. Curphey, E. *Brit. med. J.* 1941, ii, 176.

SPINAL ANÆSTHESIA FOR CÆSAREAN SECTION

THOSE who object to the use of a spinal anæsthetic for cæsarean section say that there is a twofold danger for the mother—the risks of a sudden drop in blood-pressure and of a violent reaction to the anæsthetic because the pregnant woman is unduly sensitive to the drug. The first can be prevented by the proper use of ephedrine, and this procedure seems unobjectionable in these unshocked patients; there was no example of the second complication in a series lately reported by R. C. Thomas.[1] In 121 cæsarean sections done under spinal anæsthesia one mother died nine days after operation from pulmonary embolism, and in the 123 children born there was one stillbirth and 4 deaths from various causes. All his patients were given ephedrine, gr. ¾, and atropine, gr. $\frac{1}{100}$, forty-five minutes before operation. Sedative drugs such as morphine and hyoscine were avoided, and the babies were therefore born without respiratory depression. If necessary, ephedrine was repeated during operation. Thomas does not use spinal anæsthesia for any woman with a systolic pressure of less than 105 mm. Hg; these he treats by transfusion and if the pressure cannot be raised to an appropriate level he gives them gas, oxygen and ether. Since many patients requiring cæsarean section have placenta prævia and are liable to hæmorrhage, they are moved with great gentleness and a supply of blood is at hand in case emergency transfusion should be required. In all but 3 cases in his series the drug used for spinal anæsthesia was heavy 'Nupercaine,' but the exact dosage is not stated. The mothers remained calm and cheerful throughout, and this was particularly noticeable in 5 women operated on during air-raids. Apart from the 121 cases mentioned there were 8 others to which a spinal was given and in which anæsthesia was not sufficient for surgical requirements. They were given supplementary anæsthesia and were therefore not included in the series. In the absence of fuller details it is impossible to say whether the drug or the technique was to blame for these failures. The advantages of spinal over general anæsthesia were well shown: there was good relaxation of abdominal muscles, a well contracting uterus and no respiratory depression in the babies. Infants reluctant to breathe were given an injection of lobeline into the umbilical cord; none of the infant deaths could be attributed to the anæsthetic.

COMPLEMENT FIXATION IN TYPHUS FEVER GROUP

THOUGH the Weil-Felix reaction with *Proteus* O*X19* may indicate the presence of a rickettsial disease, it does not differentiate between typhus and Rocky Mountain spotted fever. Since the clinical differentiation between these diseases is very difficult the only means of diagnosis in the past has been the inoculation of guineapigs with blood from the patient immediately it has been withdrawn. Many unsuccessful attempts at complement fixation have been made with various antigens such as alcoholic extracts of organs of fatal cases, extracts of infected lice, infected guineapig tissues and infected tick eggs. Probably all were unsatisfactory because an insufficient number of rickettsias were present. In 1936 Castaneda[2] obtained positive complement-fixation in cases of active and past infection with Mexican typhus and Brill's disease, using rickettsia from X-rayed rats infected with endemic typhus. A prolific source of typhus rickettsias was made available by Cox's discovery[3] of their ready cultivation in the yolk sac of the developing chick embryo. Bengston[4] has used as an antigen rickettsia grown by this method in a specific complement-fixation reaction for "Q" fever and endemic typhus. Bengston and Topping[5] have more recently demonstrated that the test will clearly differentiate between endemic typhus and Rocky Mountain spotted fever. Using an antigen prepared from endemic typhus, they found that in a case of laboratory infection the complement-fixation reaction was positive to a titre of 1/8 on the 10th day, rising to 1/4096 on the 15th day, and then dropping slowly to 1/512 on the 180th day. The Weil-Felix reaction was positive in a dilution of 1/80 on the 6th day and 1/320 on the 9th day, but fell more rapidly. In 53 cases of past infection the titre was 1/16 or higher even as long as 5½ years later. In contrast, 18 specimens from 14 cases of active Rocky Mountain spotted fever were all completely negative. Now Plotz and Wertman[6] have confirmed the usefulness of the test by using an antigen of Rocky Mountain spotted fever rickettsia grown in tissue cultures, using the semi-solid agar method in Kolle flasks. Sera from 9 cases of Rocky Mountain spotted fever all gave positive complement-fixation. The earliest positive serum was obtained on the 12th day of illness with a titre of 1/24, and the serum of the oldest case who had had the disease 4½ years previously was positive in a dilution of 1/12. All sera from patients who had had Brill's disease or various other illnesses were completely negative. A corresponding result was obtained with sera from infected guineapigs. Though more or less specific for the typhus group of fevers, the Weil-Felix reaction being an indirect test has never been happily accepted by many workers. These new antigens may give us a simple inexpensive direct test for diagnosing this group of diseases. It will be interesting to learn if the complement-fixing antibodies are related to the neutralising antibodies. If the two antibodies are comparable this will offer a simple means of testing the efficacy in humans of the various anti-typhus vaccines in use.

PEPTIC ULCER IN CHILDHOOD

THE early onset of some peptic ulcers has been confirmed in the course of mass investigations of young soldiers with dyspepsia, according to Tidy and others,[7] and now three papers have appeared on peptic ulcer in childhood.[8] K. J. Guthrie describes nine cases, all coming to autopsy at the Glasgow Royal Hospital for Sick Children in the period 1914–41. All but one were in infants under six months of age and the ulcers seem to have originated after birth. Sexes were equally affected and eight of the ulcers found were duodenal, one being gastroduodenal. Guthrie draws attention to the peculiar circumstances in the newborn period which predispose to ulceration. Circulatory instability, asphyxia and umbilical sepsis may play a part, and any damaged area becomes liable to digestion by the gastric juice, which according to recent work reaches a high degree of acidity in the first forty-eight hours of life. Another possible factor is irritation of the mucosa by unsuitable feeding or drugs, of which castor oil is the most blameworthy and is still too often used by midwives. In the Glasgow series the ulcers were small, never exceeding 1 cm. in diameter and almost exclusively lying in the posterior wall of the duodenum above the ampulla of Vater. Clinically, hæmorrhage from the stomach or bowel seemed to be the most characteristic sign of peptic ulcer in infants. It might be the initial feature, it might be preceded by symptoms of indigestion, or collapse might occur due to latent hæmorrhage. Peritonitis and perforation were not seen in the Glasgow series although others have recorded these complications. Pyloric spasm from ulcer may produce symptoms similar to those of pyloric stenosis. In children past the age of infancy, according to D. G. W. Clyne and J. Rabinowitch, duodenal ulcer may closely simulate acute appendicitis.

1. *J. Obstet. Gynæc.* 1942, **49**, 247.
2. Castaneda, M. *J. Immunol.* 1936, **31**, 285.
3. Cox, H. R. *Publ. Hlth Rep. Wash.* 1938, **53**, 2241.
4. Bengston, I. *Proc. Soc. exp. Biol. N.Y.* 1941, **46**, 665; *Publ. Hlth Rep. Wash.* 1941, **56**, 649, 1723.
5. Bengston, I. and Topping, N. *Amer. J. publ. Hlth*, 1942, **32**, 48.
6. Plotz, H. and Wertman, K. *Science*, 1942, **95**, 441.
7. *Proc. R. Soc. Med.* 1941, **34**, 21.
8. *Arch. Dis. Childh.* 1942, **17**, 82, 95, 102.

They describe four cases with a history of only a few hours' pain before admission. Removal of a normal appendix was followed by radiographic examination which showed ulceration in the first part of the duodenum. All cases showed a slightly raised temperature and pulse-rate, tenderness in three cases in the right iliac fossa and abdominal rigidity in two cases. Medical treatment was instituted but did not succeed in securing disappearance of the X-ray signs. A. W. Franklin, reporting two cases of duodenal ulceration in childhood, deals with still other clinical features. His first case in an infant past the neonatal period exhibited the features of a normal, healthy baby who made a good start with feeding and weight gain and then, after an upper respiratory infection, became "unhappy, refused feeds, slept badly, cried much and became difficult to handle." Changes in food produced transient improvement but a general downhill course led to a fatal ending and the finding of a duodenal ulcer at autopsy with an eroded vessel in its base. In Franklin's other case, a boy of nine years, not only was a duodenal ulcer discovered radiographically and healing secured by medical treatment but there appeared to be a definite psychological factor present in the nature of an anxiety state, which the psychologist predicted "would play a strong part in producing a recrudescence of the symptoms at a future date." Clearly peptic ulceration in infancy and childhood is uncommon but because of its rarity it may be overlooked. The clinical pictures emerging from these papers should make diagnosis easier. The possible evolution of the child with peptic ulcer into the adult with the same complaint invites speculation.

AMERICA'S MEDICAL POOL

LAST year in the medical schools of the United States 20,867 men students were in training, of whom 4884 graduated, and 1164 women students, of whom 279 graduated.[1] This year there are expected to be 22,674 students, but in response to the needs of war-time they will graduate in three years instead of four; these students will already have spent three or even four years at college before entering a medical school. All except four of America's sixty-odd medical schools have accepted this principle of acceleration of the curriculum, but there is local option as to how it is to be carried out. Most of the schools, however, have chosen the method of accepting a new entry of students every nine months instead of only once a year, and by allowing students to graduate every nine months instead of annually. This means cutting out the long vacation, which has created a real problem for many hard-up students who hope to earn enough in the holidays to pay their college fees. But the Kellogg foundation has generously come to their help with a grant of 10,000 dollars to each medical school, from which loans will be made. Congress has also voted 5 million dollars for loans to students. Another problem raised by the speed-up is that in seven states the laws will have to be altered before these accelerated graduates are eligible for licences to practise. Hospitals will also have to consider how their system of internships, which last a year, can be modified to cope with the nine-monthly influx of new graduates. It is unlikely that the period of internship will be shortened but it is suggested that, to begin with, the juniors may be posted to affiliated hospitals. The standards of medical education will not be lowered to meet the new timetable but the curriculum has been reconsidered to see where minor adjustments and better coördination can save time. Otherwise the only alteration has been the addition of such topical subjects as military medicine, first-aid, treatment of war wounds, tropical medicine and industrial medicine. The staffs of the medical schools have shouldered a heavy war-time burden, for besides the speed up they have agreed to a 10% increase in the numbers of entry classes, and many of the younger teachers have been called up. Forty schools have organised affiliated hospital units which will provide the army with staffs, accustomed to working together, who are ready to assume the medical responsibilities of a service hospital. These units are of three types: general hospitals, evacuation hospitals, and surgical hospitals. It is estimated that the next three years should provide over 21,000 new doctors, 5000 more than in normal times. The wastage of students, for which due allowance has been made, is based on figures for 1937–41—i.e., 16% in the first year, 5% in the second, and 1% in the third. By these new arrangements the authorities hope to add two new doctors to the American Medical Directory for every one that will disappear from its pages.

1. *J. Amer. med. Ass.* 1942, **119**, 1263.

LORD NUFFIELD—RCS MEDALLIST

ON the front of the honorary medal which Lord Nuffield received at the President's hands on Sept. 30 is the motto of the Royal College of Surgeons and on the reverse is a picture of Galen contemplating a human skeleton. Sir Alfred Webb-Johnson brought out this wider conception of the college's function when he spoke first of the advancement of surgery for the benefit of mankind and then of the preservation of the broad basis on which the whole edifice of biological knowledge is built. Among the 18 previous recipients of the medal are surgeons such as Paget, Lister and Makins, but also men like Richard Owen and Elliot Smith and J. A. Murray whose claim on the gratitude of posterity is even wider; the second medallist resigned his surgeoncy at a county hospital to take a house in Tavistock Square, where in the billiard room he dissected birds, beasts and fishes, to the lasting benefit of his kind. The scope of the medal was already wide enough to include a recipient whose liberal acts have conduced to the advancement of the healing art. There is scarce a Dominion, as Mr. Gordon-Taylor put it, that has not felt the generous warmth of his outstretched hand, particularly in the care of the maimed, the damaged or the scarred. Lord Nuffield admitted it had been his youthful ambition to be a surgeon; instead he had become what Gordon-Taylor called the present-day Vulcan, the blacksmith's god, skilled in metals, the artificer of wondrous things. We have already had examples of how his engineering craftsmanship has shortened, or indeed wiped out, the usual lag between scientific conception and delivery of some of the urgent implements of medicine. The Minister of Health, who was present at the moving ceremony, expressed his satisfaction that Lord Nuffield had not lavished money on expensive buildings, but had been concerned with the men and women who were to work in them. For himself he would praise him for the chairs of social medicine and child health.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN

THE first meeting last Friday of the managing board of this amalgamated hospital was followed by an austere but festive luncheon attended by the Primate and the Home Secretary. The story of the North-Eastern (just 75 years old) and the East London is like a Grimm's fairy-tale in which there was no doubt from the beginning that the two were destined to meet and live together happily ever afterwards. Both started like human babes without material possessions but with large heads and rapid hearts. Of such is the voluntary hospital tradition and Sir Ernest Pooley, speaking for King Edward's Hospital Fund, expressed the hope of all concerned that, while the State might control and plan, the individual management would be left.

EPSOM COLLEGE.—A Christie pension of £89 p.a. will be awarded in November to a necessitous medical man, fully 55 years of age, who has been registered for five years. Forms of application may be had from the secretary's office, Epsom College, Surrey, and must be completed and returned by Oct. 26.

Special Articles

RECENT GERMAN VITAL STATISTICS

RICHARD M. TITMUSS

THIS paper is an attempt to place on record some recent German mortality and morbidity statistics. The data are admittedly inadequate and should be interpreted with caution, but the material is all drawn from official German publications. No attempt has been made to examine the general death-rate because, among othes reasons, the composition—either qualitatively or quantitatively—of the population at risk is not known, and because the deaths of men in the armed forces from natural causes are, as far as I know, excluded from the official reports.

MORTALITY

Infant Mortality.—For the "Great Towns" of the Reich the death-rate per 1000 live births fell steadily from 92·9 in 1929 to 60·5 in 1934. Since then the rates have been:

1935	62·9	1939	59·6
1936	62·9	1940	62·0
1937	60·7	1941	58·8
1938	58·3		

The first quarter of 1942 registered the highest rate since 1933, namely, 74·1. In the four previous years the rate had been 61·3 (1938), 65·2 (1939), 69·4 (1940) and 73·5 (1941).

Ages 1–20.—As the Registrar-General for England has repeatedly shown in his annual reviews, one of the most sensitive indices to environmental conditions is mortality among infants aged 1–5 years. Before the war the death-rate in this group was steadily rising in the German great towns and the combined rate for the two years 1940–41 was higher than that during 1931–33, when the urban population of Germany was suffering severely from the effects of the world economic slump. For the 62 great towns (with populations exceeding 100,000—a total of 24½ millions) of "Greater Germany" the number of deaths in this age-group in recent years has been 5670 (1939), 6062 (1940) and 6404 (1941)—a rise of 13% over 1939, although the total population of the great towns has not changed significantly. Before 1939 the number of deaths in the 56 great towns of the Old Reich—with a fairly stable total population around 20 millions—had been rising steadily: in 1935 there were 3866; in 1936, 4307; in 1937, 4220; and in 1938, 4675. The change in the birth-rate cannot account for the rise between 1939 and 1941 because the major increment in births took place in 1934. When we compare the first 28 weeks of 1942 with the corresponding period for previous years we find that the number of deaths has risen from 3618 in 1940 to 4355 in 1942. In addition to the rise of 13% between 1939 and 1941 there has been a further increase during the first 28 weeks of 1942 of 20% over 1941. The winter cannot be blamed for this increasing mortality because, from the point of view of health, climatic conditions were not severe.

Similarly with school-children, for we find that the deaths have risen from 4336 in 1939, to 4337 in 1940 and 4880 in 1941. On the top of this record number of deaths in 1941 for the age-group 5–15 a further increase of 22% has occurred during the first 28 weeks of 1942 over the corresponding period for 1941.

In the age-group 15–20 mortality has increased by 20% (the first 28 weeks of 1942 over 1939). This rise, moreover, excludes the deaths of young men in the armed forces both from disease and hostilities. The deaths in the age-groups quoted also exclude air-raid casualties.

SPREAD OF INFECTIOUS DISEASES

Contributing to the increases in mortality among children scarlet fever deaths in 1941 reached 1327, the highest number of deaths in any single year since at least 1929; the previous record number in any one year since 1929 was 635 in 1940 and 445 in 1939. Diphtheria and whooping-cough mortality has also risen, the combined total for 1940–41 being 7005 as against 4862 for 1937–38. Between 1932 and 1937 mortality from both diphtheria and scarlet fever among children under 15 rose steadily, the increase in both cases being roughly 50%.

In addition to the rise in mortality there has been a great increase in the number of new cases of infectious diseases; the numbers in all areas of the Old Reich were:

Year	Diphtheria	Scarlet fever	Whooping-cough	Dysentery	Trachoma
1936	149,973	125,679	..	4816	625
1937	146,733	117,544	..	7545	697
1938	149,627	114,243	..	5265	533
1939	143,585	129,495	78,941	6190	652
1940	142,058	138,759	126,994	12,790	2979
1941	173,052	247,744	93,694	8641	2770

These increases are striking enough but the first 28 weeks of 1942 show a further rise over the corresponding period of 1941. For all areas of "Greater Germany" the number of diphtheria cases has risen by 42,000 to 130,000, while scarlet fever cases are up by 101,000, to 238,000.

TUBERCULOSIS

Tuberculosis is always a sensitive barometer of the extent to which a community is caring for its people. New cases of respiratory tuberculosis in all areas of the Old Reich have been as follows:

	Quarter—			
Year	I	II	III	IV
1935	15,649	16,200	18,186	10,341
1936	15,835	16,095	18,218	10,579
1937	16,881	17,787	15,034	13,868
1938	16,052	16,441	14,233	13,694
1939	19,431	18,448	15,816	14,195
1940	17,096	21,778	17,514	16,879
1941	20,660	24,155	20,266	16,962

Taking the averages for the years 1935–38 as a base-line the increases amount to: 1941, first quarter 28%; second quarter 45%; third quarter 23%; fourth quarter 40%; all quarters 34%. For other forms of tuberculosis the 1941 notifications record a rise of 92% over 1939 (before this year cases were not notified). The three years 1939–41 have produced 40,000 *additional* new cases of respiratory tuberculosis. Just as morbidity has been rising so has mortality. The mortality from all forms of tuberculosis at all ages in the great towns of "Greater Germany" were as follows (rates per 1000 total population):

	Quarter—				
Year	I	II	III	IV	Total
1939	0·76	0·72	0·56	0·61	0·66
1940	0·82	0·81	0·63	0·63	0·73
1941	0·84	0·82	0·69	0·64	0·76
1942	0·88	..	..	..	..

It is worth noting that the rate for the first quarter of 1942 is higher than that of the years 1932 and 1933. A considerable rise is again revealed when we examine the death-rate from all forms of tuberculosis in two large groups of great towns. Group 1, the Rhine and Westphalia, comprises 19 large towns such as Cologne, Essen, Dortmund, Dusseldorf, Duisburg, Gelsenkirchen and others, with a total population of 5½ millions. Group 2 relates to 14 great towns (total population nearly 5 millions) in Silesia, Saxony and South Germany, such as Leipzig, Dresden, Chemnitz, Breslau, Nuremberg and Munich. Taking the years 1936–38 as a base-line we find that weekly deaths in the (by now) heavily bombed towns of group 1 rose by 10% in the first quarter of 1942 and by 20% in the second. In group 2 the increases are 12% and 16% respectively.

When it is remembered that all these war-time statistics relate to civilian deaths only and that many patients suffering from tuberculosis will have been removed from the towns in western Germany it may well be that the true increase in this disease is much higher than is estimated in this paper.

These figures do not, of course, cover a very large field but they do comprise, in the main, significant indices. Moreover, the tuberculosis statistics may considerably understate the actual situation, particularly in western Germany, not only because of the effects of air-raids but because of the removal of some millions of young men from the total population at risk.

TUBERCULOSIS IN WAR TIME

REPORT OF THE MRC COMMITTEE

THE committee appointed in the autumn of 1941 by the Medical Research Council at the request of the Ministry of Health to investigate the war-time increase in tuberculosis, particularly among young women, has brought in its report.[1] This differs from the council's other special reports in describing no new researches but presenting rather a critical review of available evidence. In the committee's view this evidence is already sufficient to justify administrative action. The findings and the recommendations based on them are as follow.

FINDINGS

There has been a real increase in deaths from tuberculosis since the beginning of the war.

All age-groups have been involved to some extent in the increase, and the participants up to the present have not been predominantly young women—as seemed likely early in the war—but include, particularly recently, children and the older male age-groups as well.

Although there has been a slackening in the increase in tuberculosis mortality in the second year of the war—e.g., in young adult females—the position is still unfavourable in relation to the prewar figures.

In view of the similar, though only temporary, slackening in the rise of tuberculosis at a corresponding time in the last war, together with what is known as to the course of tuberculosis, we must be prepared for a further increase as hostilities continue.

A disquieting feature of the present position is the increased mortality of children from tuberculous meningitis. Measures have been indicated which should reduce the deaths from bovine infection. To reduce human infection it is necessary not only to take special measures with children, but also to control pulmonary disease in the adult. The suggestions which have been made for the early detection, segregation and adequate treatment of the tuberculous adult should have an indirect effect in reducing infection among children.

RECOMMENDATIONS

The implementing of these recommendations should be accompanied by information and propaganda both to the medical profession and to the general public.

Mass radiography.—Subject to limitations of apparatus, the controlled use of mass radiography before, or as soon as possible after, employment should be extended, especially (*a*) in the Services, (*b*) among men and particularly women entering the war industries, and (*c*) among those taking up certain other occupations. A single mass X-ray examination should be carried out, where practicable, upon those already employed in certain industries—e.g., munition factories. As an extension of the preceding, but probably practicable to a much less extent in war-time, X-ray examinations should be repeated at regular intervals upon certain groups of the population including (*a*) employees in factories which contain large numbers of young adults, (*b*) nurses and medical students, and (*c*) merchant seamen. Where speed and cost dictate, the miniature method is the one of choice for mass radiography. In certain circumstances it may be practicable to make use of existing full-size apparatus.

Institutional accommodation for the treatment of tuberculosis is urgently required. A good deal is now available but cannot be used because of lack of nursing and domestic staffs. Until these staffing problems are solved, no advance can be made in institutional control of the disease.

Financial provision.—In view of the special character of the disease and the prolonged treatment usually required, special financial provision greater than that obtainable under the National Health Insurance scheme should be made for persons with tuberculosis.

Rehabilitation should be considered an essential part of the treatment of tuberculous persons, and arrangements should be made for the gradual return to industry of such patients on a basis of part-time or modified work. During the period of rehabilitation a supplement to wages should be provided, in order that an adequate standard of living can be maintained by the patient and his family.

Examination of all home-contacts must be energetically pursued, a first examination being the chief requirement. The re-examination of children under five years of age, and of young adults, is highly desirable. X-ray examination, and re-examination at intervals, should be undertaken for all cases of pleurisy and erythema nodosum in young people, whether institutional treatment has been given or not.

Mental hospitals.—The special conditions here prevailing make it desirable that an effort should be made as soon as practicable to X ray periodically all residents of such institutions.

General working conditions.—It is of the first importance that continued watchfulness should be maintained upon the working conditions of young employees, particularly in regard to hours of work, transport difficulties, rest periods, factory canteens and hostel arrangements, and their relation to sickness absence.

Milk.—The pasteurisation of milk should be extended throughout the country, and, where this is not practicable, all milk consumed by children should be boiled or dried milk should be provided.

1. MRC Special Report Series. No. 246. HMSO. 9*d*. The committee consisted of Lord Dawson (chairman), Dr. T. Stenner Evans, Prof. M. Greenwood, Dr. F. R. G. Heaf, Dr. G. Gregory Kayne, Sir Alexander Russell, Miss May Smith, D.Sc., Dr. Norman F. Smith, Wing-Commander R. R. Trail, Prof. G. S. Wilson and Dr. P. D'Arcy Hart (secretary).

MILK IN THE HOLIDAYS

MORE and more school-children are drinking milk: before the war a little over half of them were getting it and now the latest available returns show a rise to 79·8% in England and Wales and 65·1 % in Scotland. Unfortunately school holidays are apt to make a break in these good habits, and the difficulties of continuing milk distribution during these gaps are considerable. The Children's Nutrition Council[1] have been interested in the efforts made by local authorities to bridge the gaps.

The children show varying readiness to attend school or some other centre merely to receive a third of a pint of milk, and of course it is not easy to provide staff to serve it out. The Edinburgh CNC has made a special study of the situation. Holiday distribution of milk had been tried in 1938 unsuccessfully, but urged by the CNC the education committee agreed to try again during the Easter holidays this year. The local press published articles and, later, pictures of the children taking milk; a letter from the council was published and bills prepared by the education committee were distributed to clinics, hospitals and other centres, and the branches of coöperative and other multiple stores. The time of distribution was 11.30 A.M.–12 noon, and 32 schools were used as distribution centres—roughly a quarter of the schools under the education authority. There was a fair response, the consumption per day being 27% of the usual daily school consumption, or an average of 9770 children daily as compared with an average of 35,000 in term time. All children under 15 were included so that the toddler could come along with the older child who had been told off to mind him.

The CNC had some suggestions to make for improving results another time. Thus they think the hour was too late, too near dinner time. Opening of a larger number of schools would have relieved congestion, and given many more children the chance to attend their own schools and avoid a longer walk than they were used to. Some schools had no straws. The local branch of this council, with its affiliated organisations and such bodies as women's guilds and mothers' committees could provide rotas of responsible voluntary helpers, and many teachers would be prepared to give odd days in the holidays. There seems, indeed, plenty of good will to help to maintain the holiday distribution, and get the milk to its target.

1. *War-Time Bulletin.* No. 20. Published by the CNC, 6, East Common, Harpenden, Herts.

Messrs. Southalls inform us that they are now able to supply their 'Southalamide' gauze to doctors and hospitals in 6 yd., 3 yd. and 1 yd. packets. This sterile surgical gauze is impregnated with approximately 30% sulphonamide and the manufacturing process is designed to ensure slow absorption, and prevent the shedding of the medication. Prices of this new wound dressing may be had from Messrs. Southalls, Charford Mills, Saltley, Birmingham, 8.

In England Now

A Running Commentary by Peripatetic Correspondents

I HAVE just been to a war-time christening and it happened this way. The matron of our largest nursing-home had seen it grow into a well-equipped and very efficiently run institution of some 20 beds when the bombshell fell. Quite literally, too, but luckily at some little distance, so that owing to the precautions taken no-one was hurt. Nor was the house badly damaged, as damage goes in our much bombed town, but its days were over as a nursing-home; windows there were none, doors were few and the roof resembled a colander. And, as I told her next morning when we surveyed the wreckage, how could I send her patients if the rooms weren't even dusted? True, the dust was mainly two inches of ceiling plaster, but from whatever angle you look at it, air-raids are a dirty business. With her usual indomitable pluck, matron took the best available house in the neighbourhood, alas with far less than her 20 beds, and there, when our patients are lucky enough to secure an empty bed, we gladly make the 8-mile journey. In her more spacious country surroundings she decided to keep chickens, and today the first four hens had arrived, ready, we hope, to make some amends for that egg dropped by the Luftwaffe. "I'm christening them today," she said, "and of course in these days we think first of Winston Churchill, so they are to be Blood, Tears, Toil and Sweat." Though perhaps the chicken world manages those things more easily, I thought of the curse laid on the daughters of Eve and how appropriate the names were for the most industriously maternal of all our domestic animals.

* * *

They had a sing-song in the hostel in which I live, and I am ashamed to say I didn't go. But it was difficult not to hear them singing, and with each song memories I did not wish for came flooding into my mind. Presumably the psycho-auditory centres keep accurate copies of those scenes which the psycho-visual centre and the frontal lobes have long since and carefully repressed. Normally the past does not distress me in the least; I have carefully sifted out for consciousness those scenes which make for happiness. But hearing Auld Lang Syne brings detailed pictures of the other times I have sung it, of the people at school, at Oxford, at a Christmas dance, whose acquaintance, since I am unlikely to renew it, it would perhaps have been better to forget for good. Smells are as bad. Walking along a most innocent road the other day I was first assailed with a momentarily irrepressible longing for a house on an estuary in Wales and then within twenty yards for pine trees and honeysuckle in Georgia. But on the whole there are more smells than songs, and it is safer to have an open nose than an open ear; though there again, I am thankful to say, they change the tunes so often that it is only the very best—*Donkey Serenade* and *Begin the Beguine* and *Waltzing Matilda*—which last long enough to repeat the memories of a few years back. Such few as there are fill me with admiration for the memory-repression mechanisms of the other parts of my brain. I can only think of one song whose immediate memory-associations are wholly good—*Steal away*. It reminds me of a time when an old lady had died, and a thousand negroes sat on the lawn of her plantation singing that song with tears running down their cheeks, so beautifully that she must surely have heard. For the vividness of that one memory I can forgive my psycho-auditory centre a lot.

* * *

A country practitioner whom I met last month showed me the records of 20 patients who had developed hypertension within two months to ten years of hysterectomy. "Why don't you publish them?" I asked. "Probably I should be told that my observations were cold potatoes, Blitz having recorded 500 cases in 1921 and Krieg having written a book about it." In the bright new world I hope they will have a room or two in Health and Hygiene House where such reports from the front line of medicine can be examined and sifted. Possibly also they will have their own broadcasting station. I seem to hear the droning voice of Pontifex Maximus FRCP giving one of his bed-time talks to GPs. "... is the most likely theory of hyperpiesia. Goldblatt found that by constricting the renal arteries of animals he produced hypertension, then Wilson and Byrom went on to show that they could get the same result by constricting one artery. That it isn't only a renal threat that causes a heightening of the blood-pressure was pointed out by Raab, who recalled that it was experimentally produced by restricting cerebral blood-supply. It is as though Dame Nature said, 'The fate of a vital tissue is at stake, we must give it more blood.' As in shock she is quite willing to run risks with the whole in order to save a vital part. And the poor, blind old dear doesn't know when to leave off. Probably she is encountering a condition that was so rare in the first million years or so of her wet-nursing of us that it wasn't worth bothering about. Why she should translate a hysterectomy as a threat to what she must regard as the most vital organ of all, I'll leave you to guess. It would be interesting to know if constriction of the spermatic arteries also raises the blood-pressure. If this theory is right it most certainly should, and I feel in my bones that mine would. How does it act? Heaven alone knows, but probably by the old primitive mechanism of a chemical acting on the autonomic and the autonomic stimulating the production of the chemical, a circular reinforcement. Of course this is all theory. Probably it is impossible to record any events in the natural world truthfully. In fact truth as a static, unchangeable reality—apart from those man-postulated artefacts, words and figures—is a human misconception. There is no such thing as truth, everything is changing, moving, angled and relative. But it makes a very workable hypothesis to say that truth exists. It might be called 'The Master Hypothesis.' So with this hypothesis of the cause of hypertension, the truth is . . . But I see my time is up. Good-night GPs. Good-night."

* * *

A butterfly orchis in a vase in front of me was picked ten days ago and seems unchanged; all the pollinia are in place. Others in the copse have been fertilised by long-tongued moths, the only insects which are capable of doing it, and are starting to wither. I think the youthful appearance of many single middle-aged people may be on the same parallel. Thanks to this infinite patience and this cold-storage of charm not many flowers, only some of the more highly specialised, are, I fancy, born to blush unnecessarily in nature. Another display of the same qualities is seen in courtship. Any reflective watcher of animal life must often have been struck by this contrast: the length of it, the elaborate ritual, for which so many dress up or undergo structural change, prepare for months, sometimes their whole lives, all this, and then the rapid, hurried, darkened, rarely seen consummation. Marie Stopes and others have pointed out how prolonged love-play conduces to fertility, and we old country practitioners know how the lad and lassie in Love Lane who struggle at length and victoriously against the scowling gods of propriety, the frowning powers of Church and State, the angry parental deities, nearly always produce a bonny babe, whereas the suburban know-all who treats his consummation as an afterthought to a wash and brush-up goes bald and childless. Incidentally contraceptives may stop fertility in more ways than in preventing spermatozoa getting to the ova. My point is this. Prolonged courtship, the aim of which is that the one man should meet the only woman in the world or as near to this novelists' ideal as nature can manage—a discarding of unsuitable genetic combinations, a long process of selection which is abandoned in times of racial stress—demands a contradictory attitude of mind. It must be one that is so intensely attracted that his or her whole mind is ruled by that attraction, and yet at the same time inhibited, in the human mind by various creeds, customs and codes (I wonder what form this takes in the mind of the rabbit—The Big Bad Buck—The Weasel Banshee?), lest consummation come too early. This surely is one of the bases from which one should start the study of sexual taboo.

* * *

"Well," said Helen with a sigh, "I suppose it's got to be done—shall we make a start?" I rose reluctantly to my feet and together we went out to the garage, for the task in hand was that which has faced so many of us lately—laying up the car. Dear old George. I felt a fresh uprising of regretful affection as I gazed on his war-worn paint, but, as Helen said, it had to be done, and so we got to work. I sorted tools and greased

lamps and bright parts (vide advice in the daily press), while Helen applied herself to cushions and upholstery with the energy of a terrier at a rabbit hole. For a time we worked in silence, but for the whirr of the vacuum cleaner, and I knew that her thoughts were, like mine, with all the occasions in which George had played so large a part: not only his stalwart help in my professional work, but those happy care-free holidays, our annual outings to Wimbledon and Twickenham and scores of others. Oh, well... some day. Suddenly the roar of the vacuum stopped and Helen emerged from the car holding out a small piece of green cardboard. "Look at this," she said, "it was behind a cushion." It was a car-park ticket for a point-to-point meeting in April '39, and my thoughts raced back over the shadowed years between. I remembered it so well; as lovely a day as April ever provided and as we walked round the course before the first race the larks were singing and Spring was everywhere. There was the usual cheerful crowd of men and girls in tweeds, children home for the holidays, country folk complete with perambulators, raucous-voiced tipsters, horsey-looking men, picnic luncheons laid out behind the cars, and, incidentally, the racing. It was a *good* day, and I remembered, too, Helen's annoyance at not having backed a horse called "Peter's Pet," which won at long odds. She knew nothing, of course, about its capabilities, but she had just met a young friend called Peter with his very new fiancée and that should have been a good and sufficient reason, in her view, for backing it. Suddenly she laughed: "It was broken off soon after," she said, so I knew that her memory was working on the same lines as mine. Presently George's toilet was completed, and shrouded in dust sheets he was left to rest until happier days. So now, to save petrol and rubber, I go my rounds in Helen's little 8-h.p. bus, and she does her share by carrying laden baskets up the mile of hill from our nearest shops.

* * *

Housemen lack none of the courage and initiative of their predecessors, at any rate mine doesn't. His interest ranges over the whole field of medicine, with a strong bias towards psychiatry. One patient had a very severe tic, which he asked permission to treat by psychotherapy. Next day I asked how it was progressing, and was told that after two hours' intensive treatment he found he had been talking into her deaf ear. Later, we admitted a diabetic for observation who appeared to be developing psychiatric symptoms in addition. He confessed to having taken his usual 30 units of mixed insulin that morning, though in his apathy he did not mention the unusual extra dose which the HP gave him that evening. The comments of those called up to treat the hypoglycæmic convulsions at 3 A.M. temporarily flattened the HP, but the outcome left him on the pinnacle of success, for the morning found the patient pale, shaken and a little distrait, but in his right mind. Some days later a consulting physician came down to see a case suspected of being glandular fever. He is of the younger school, with a deliberate manner. Having given his opinion he said he felt himself a particular authority on glandular fever, since he was just recovering from it, and he proceeded to recount some of the more unpleasant symptoms.

Physician: "All the glands of the body tend to enlarge, including the epitrochlears."—HP: "Were your epitrochlears enlarged, Sir?"—Phys: "Yes, they were."—HP: "I thought they *only* enlarged in syphilis, Sir?"—Phys: "I can assure you they sometimes enlarge in other conditions as well, mine were enlarged, and I had glandular fever." Here the HP lapsed into silence, still looking unconvinced, but he brightened later and returned hopefully to the attack.

HP: "Did you say that the WR was sometimes positive in glandular fever, Sir?"—Phys: "I did."—HP: "Was your WR positive, Sir?"—Phys: "Sorry to disappoint you, Mr. Smith, but my WR was negative, and I did *not* have syphilis, but glandular fever."

Here I suggested moving on to another case.

* * *

SPORTSMAN'S LAMENT, 1942

If I had plenty of time to spare
And petrol enough to get me there,
And if I could buy some cartridges
—Wouldn't I shoot some partridges!

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS, M.P.

THE debate on the coal situation and the demand for rationing have brought us up against one of the most difficult war-time problems for industry and one of the most uncomfortable problems for the ordinary citizen. There is a big deficit, Mr. Gwilym Lloyd George put it at 11 million tons, between production and consumption. It may be more. The Minister thinks that the gap can be bridged. But the House as a whole is sceptical. On output Mr. D. Grenfell, former Secretary for Mines, warned the Minister not to weigh his coal until it was in the bag.

From the point of view of the health, and convenience, of the country the Government did well to announce priority in distribution for the households taking about 1 cwt. a week. If this is maintained, and it depends not only on general distribution but on local distribution by retailers, some of the worst difficulties will be overcome. For nothing would be more disastrous than to subject the people of these islands in the fourth winter of war to an ordeal by cold. Mr. Grenfell said you could not make war with cold feet. What is equally important perhaps is that you cannot get good production on cold dinners and bad cooking. Nor can you maintain good health. These aspects of the matter are very much in the minds of members but received less attention in debate than the conditions in the coal industry itself on which so much depends. Major Lloyd George is a judicially minded man whose ambition it was said, before the war, was in the direction of the speakership of the House rather than that of minister. And it is perhaps lucky that what is one of the most difficult ministries has him at its head.

Whatever the decision of the Government may be, whether rationing is adopted or voluntary economy aided by slogans and reinforced by limiting orders, the coal industry itself is becoming more organised. Mr. Tom Smith, parliamentary secretary of the ministry, gave a good deal of information about the new medical service. The present staff of one medical officer at the HQ of the ministry is to be increased by another nine, making ten in all of whom two will remain at HQ and eight posted to the coal-producing regions into which the country is divided. The duty of each regional MO will be to deal with medical services at the pits, away from the pits, and with the checking of medical certificates. The provision of first-aid organisation in the pits, and the provision of ambulances, is to be brought up to date. That the provision of these services still leaves some work to be done is a serious comment not only on the humanity but on the commonsense of colliery organisation. The prevention of occupational diseases and the promotion of physical fitness are other sides of the problem. Nystagmus is declining, largely, so the Parliamentary Secretary said, because there has been extra illumination. The provisions in operation in respect of silicosis are to be extended to conditions set up by other agents than silica and grouped under the term pneumokoniosis. In some pits there are more boils and carbuncles than in others and another industrial disease claiming attention is dermatitis. The regional MO will be expected to go down pits and investigate for himself and he looks like having plenty to do.

The regular inspection of juvenile workers is not proposed for the present, on account of shortage of staff, but a preliminary inspection on entry is to be the rule. Service away from the pits comprises panel treatment and hospital treatment both as in- and outpatients. The expenses of a miner attending for outpatient treatment, if sent by his doctor, are in future to be paid in full. A rehabilitation centre is being set up in Scotland and the Mansfield rehabilitation centre is accepted as a good type of institution. Certificates presented with an application to leave the industry on medical grounds will be lodged with the regional MO and arrangements made for checking the numbers and local origin of the certificates. Regions vary greatly in the numbers certificated under this head, but in one quarter there were just under 20,000 applications to leave the

industry based on medical certificates. Absenteeism is to be treated, if it is found to depend on any medical disability, and to help with this the question of maintenance of the man and his family during treatment is being given careful consideration. Quite clearly the scope of the mining medical services is wide and difficult of exact definition at present. But miners are to be looked after as never before and the question of accidents considered as never before. The country is at last realising the value of its miners. Absenteeism is not a new problem and Mr. Smith quoted from a Scottish Act of Parliament in 1641 as follows: "Coal hewers in Scotland doe ly from their worke at Pasch Yule Whitsunday and certain other tymes of the year which was of great offence to God and prejudice to the coal-master." We are beginning to get away from that attitude now—but perhaps because of our past indifference we shall be cold this winter.

* * *

To turn from the coal debate in the Commons to the debate in the Upper House on Lord Strabolgi's magazine article was to go from a grim battle-front to a panoplied display of dashing commando tactics. Lord Lovat, in uniform, spoke as if to his men. He called Strabolgi's criticisms bunkum and asked whether apprenticeship to the technical trade of soldiering was waste of time. "Tell that to the A.E.U.," he said. He hotly resented the accusation that army officers were drawn from a class of British junkers. Strabolgi's reply showed that he wrote his article at the request of Quentin Reynolds to counter unfair criticism of the British Army in the U.S.A. and quoted his first sentence. "Fundamentally nothing is wrong with the British Army." In withdrawing his motion for papers, which is the procedure in the Lords when a debate has achieved its purpose, Lovat said, "I have had great pleasure in crossing swords with Lord Strabolgi." And so a colourful debate ended with members of the Commons present considering that Lovat had done very well and Strabolgi put up a very good apologia. How unfortunate it is that no constitutional arrangement exists by which a brilliant soldier could come and talk to us in the House of Commons—although of course he could get elected—probably as "Independent."

QUESTION TIME

Food for Occupied Territories

Mr. D. M. FOOT, parliamentary secretary to the Ministry of Economic Warfare, replying to Sir THOMAS MOORE, said: While exact statistics are not obtainable, I fear there can be no doubt that an abnormally high death-rate prevails among Greek children. It is a reasonable inference that this is partly due to scarcity of milk and fats. Before the war Greece was substantially self-supporting in milk, and a very large exporter of olive oil. My information is that both these commodities have been requisitioned or otherwise acquired on a considerable scale by the occupying authorities, who must therefore be held responsible for the present acute shortage. The Swedish scheme for the importation and distribution of wheat from Canada has only been in operation for a short time. I cannot give any fresh undertaking as to the future, at least until the results of this experiment are known. Statements in the press that milk was available in South America and that it was impossible to get it to Greece owing to the refusal of navicerts by the British Government were misleading. He understood that the supplies of milk were not yet available and the Government had received no applications for navicerts.

In answer to a further question Mr. FOOT said: While information about conditions in the Channel Islands is necessarily incomplete, the evidence available suggests that although there is a shortage of food in the islands by comparison with this country, and an almost total lack of certain particular products, the effect of the deficiencies has not been such as to impair the general health of the inhabitants.

Mr. A. EDEN, replying to Mr. V. BARTLETT, said: Recent reports show that while conditions in the internment camps in Hong-Kong have to some extent improved since the early days, the general health of the internees has seriously suffered from lack of proper food and medicines. A sum of money has been allocated from official funds and has been transferred through the Swiss Government to the International Red Cross delegate at Hong-Kong. But owing to shortage of local supplies which can be purchased by the internees, only temporary relief can be afforded by this method. The Japanese authorities have refused to allow special relief ships for prisoners of war and interned civilians to be sent to Hong-Kong and other territory occupied by them; they have, however, agreed that food, clothing and medical comforts might be sent by the ships on which British and Japanese officials are being exchanged on their return voyage. This means that unless and until the Japanese Government alter their decision, the scale on which it is possible to send relief supplies is strictly limited. Full advantage was taken of the exchange ships and the total amount of the supplies shipped in them was about 4000 tons. Arrangements have been made for an equitable proportion of these supplies to be landed at Hong-Kong, and the first ship is due to reach Hong-Kong within the next few days.

Scientific Advisory Committee

Mr. IVOR THOMAS asked the Lord President of the Council who were the members of the Scientific Advisory Committee of the War Cabinet and what were the duties of this committee.—Sir JOHN ANDERSON replied: The scientific members of the committee are: Sir Henry Dale, MD, PRS, Prof. A. V. Hill, and Prof. A. C. G. Egerton (joint secretaries of the Royal Society), Sir Edward Appleton, secretary of the department of Scientific and Industrial Research, Sir Edward Mellanby, MD, secretary of the Medical Research Council, Prof. W. W. C. Topley, MD, secretary of the Agricultural Research Council. The functions of the committee are: to advise the Government on any scientific problems referred to it; to advise Government departments, when required, on the selection of individuals for particular lines of scientific inquiry or for membership of committees on which scientists are required; to bring to the notice of the Government promising new scientific or technical dvelopments which may be of importance to the war effort. Replying further to Mr. THOMAS, Sir J. ANDERSON said he had sometimes wished that departments would make more use of the services of this committee. It had been of great assistance to the Government as a whole and to departments.

Miners' Diseases

Mr. JAMES GRIFFITHS asked the Minister of Fuel and Power whether the incidence of industrial diseases among coal miners was increasing and if he would give figures showing the increase in the number of cases of dermatitis and the reasons for the increase.—Major LLOYD GEORGE replied: There has been some increase in certain categories of disease and some decrease in others during recent years. For reasons which are at present obscure the number of cases of dermatitis among miners certified by examining surgeons for purposes of Workmen's Compensation has increased from 224 in 1937 to a provisional figure of 571 for 1941. As the problems of dermatitis also arise, and to a greater extent, in the case of factory workers, I am consulting with the Minister of Labour and National Service as to the best lines of investigating the matter more closely.—Mr. GRIFFITHS: Will the Minister bear in mind that there is considerable opinion among the medical men who serve in the mining areas that this increase of dermatitis, which is very serious, is due to certain deficiencies in the diet, and will he have immediate inquiries made into that point?—Major LLOYD GEORGE: I have had inquiries made into one section of diet to which the hon. member has previously referred. He will not be surprised to hear that medical opinion is exactly the opposite. There has been an increase which has not been confined to the mining industry nor to the war years. I am making the most careful inquiries.

Midwives and Nurses

Mr. E. BEVIN informed Mr. R. DE LA BERE that he already had powers under the Defence (General) Regulations to direct midwives or nurses at present otherwise engaged into branches of the profession where there were shortages. He was in consultation with the Minister of Health on the general question of supply and employment of midwives and nurses.

Chiropodists in the Army

The Secretary of State for War informed Mr. JOHN DUGDALE that, in view of experience which suggested that more skilled treatment might be desirable, he was now considering the attachment of fully qualified chiropodists to field medical units in the army.

VAD Committee

In reply to a question Sir. J. GRIGG stated: Arrangements for setting up a committee "to consider the scope and method

of employment of Mobile Voluntary Aid Detachments by, and their relationship to, the Services," have just been completed. Colonel W. Elliot has agreed to be chairman; and a representative has been nominated by each of the three Service departments, the Ministry of Health, the Ministry of Labour and National Service, the British Red Cross Society, the Order of St. John of Jerusalem and the Council of County Territorial Associations. The chairman has suggested that Mrs. J. L. Stocks, who was a member of the Committee on Amenities and Welfare in the Women's Services, should also serve.

Medical Women Officers for WRNS

Sir ERNEST GRAHAM-LITTLE asked the First Lord of the Admiralty whether he would consider the desirability of appointing medical women to serve in stations in naval commands as in other of the fighting services.—Mr. ALEXANDER replied: It has already been decided to appoint a woman naval surgeon at one of the WRNS establishments and other appointments are under consideration.

Air-raid Casualties

During the first three years of war 47,305 civilians were killed and 55,658 were injured and detained in hospital due to air-raids on the United Kingdom. The figures for Greater London only included in these totals are 20,110 and 26,071 respectively. (Mr. H. MORRISON in reply to Mr. H. BROOKE.)

Addition of Calcium to Bread

Mr. J. H. MARTIN asked the Parliamentary Secretary to the Ministry of Food whether in view of the diversity of medical opinion as to the effect of adding calcium to bread, he would consider offering two loaves to the public, one containing calcium and one without.—Mr. W. MABANE replied: My department is guided in all matters affecting medical questions and public health by the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council. As this committee strongly advised that calcium should be added to all flour and that there should not be an alternative loaf containing no added calcium, the Minister sees no reason for adopting the suggestion.

Diphtheria Immunisation

Mr. BROWN, replying to a question, said: The returns regarding diphtheria immunisation obtained from local authorities as a whole at Sept. 30, 1941, showed that between Jan. 1, 1940, and that date the number of notifications in England of diphtheria in children under the age of 15 was approximately 51,700, and that approximately 2380 of these children had received a course of immunisation. In the same period the total number of children immunised under local authority arrangements in England was approximately 1,889,000. By the end of June, 1942, this number had increased to close on 3 million.

Insulin and Needles for Diabetics

Mr. J. J. TINKER asked the Minister of Health if he was aware of the hardship caused to diabetic patients by the increased prices of insulin and needles which they must have; and if he would consider means to prevent these continued increased prices so as to place them within reach of all who needed them.—Mr. BROWN replied: I am aware that prices have increased, but having regard to the free provision of insulin and the necessary appliances for administering it under the National Health Insurance and public-assistance schemes, I do not think that there is a case for any special measures to prevent any increases which may be warranted by the conditions of production.—Mr. TINKER: Could not something be done for people in need of insulin outside the societies mentioned?—Mr. BROWN: I understand that Mr. G. Griffiths has been discussing the matter with the Parliamentary Secretary.—Mr. GRIFFITHS: Does the Minister know that the discussion has failed badly, and is it not time that the Minister did something for people suffering from diabetes? There is a person in my division taking 90 units a day, and she cannot get a penny piece. I hope the Minister will rise to the occasion. If he subsidises the price of insulin that will do something towards it.—Mr. BROWN: That is a point that we are looking at now.—Mr. GRIFFITHS: I want the Minister to do it, and not to look at it.

Medical Schools Committee

Mr. BROWN informed Sir ERNEST GRAHAM-LITTLE that the universities and medical licensing bodies were not consulted as to its composition and subjects of inquiry before the interdepartmental committee on medical schools was formed.

Letters to the Editor

TIME OF UNION IN FRACTURED TIBIA

SIR,—The article by Burns and Young in the *Lancet* of Sept. 12 brings before us again the necessity for defining what we mean by union and when we are entitled to say that union has taken place in x weeks or y months. Burns and Young do clarify this quotient but I still feel that "union" is a loosely applied term. In their recent textbooks on fractures neither Watson-Jones nor Perkins sets down any criteria on which to form the opinion that any particular fracture has united at any given time. Perkins writes: "Experience tells us that a fracture will unite and consolidate in a certain time. (See page 23 for time-tables.)" This is hardly a clinical or physiological definition. Surely if we are to form comparisons we must have some standard from which to assess when union has occurred. Otherwise a fracture which one surgeon would consider united might be deemed not fully united by another. I suggest some such classification as the following:

Signs of union may be (*a*) clinical, (*b*) radiological.

Clinical—Rigidity of the fragments after x weeks. Loss of tenderness on percussion. No tendency to angulate under strain in use.

Radiological—Callus. Well calcified Fracture Line. Disappearance of; Growth of trabeculæ across.

Bone Substance. Changes in:

1. Callus
   - Absorption of excess
   - Moulding of by the periosteum.
2. Osteoid tissue
   - Osteogenesis of endosteal callus
   - Disappearance of the osteoporosis of the bone ends at the site of fracture.
3. Bone. Restoration of the normal density, structure and detail at the site of fracture and for a short distance above and below.

Some standard on these lines would render comparison of surgeons' tables on union more equitable.

Harley Street, W.1. G. O. TIPPETT.

SIR,—Some of the facets of the problem of the rate of union of the fractured tibia presented by Burns and Young in your issue of Sept. 12, and more critically illuminated by your annotation on the subject, prompt me to try and add a few more, as the subject still seems to be exciting interest.

In 1840, talking of fractures of both bones of the leg, Malgaigne says, "The callus forms in thirty-five to forty days, and we may take off the apparatus, and let the patient move his leg in bed without any inconvenience resulting."[1] In 1860, Hamilton in America states, "The average period of perfect union in 29 cases, including those in which union was delayed by extraordinary causes beyond the normal time, was forty days; the general average under ordinary circumstances may be stated at about thirty days."[2] In 1750 Heister gives thirty to fifty days as the period of union,[3] and this period seems to be the generally accepted one at least till 1900, when an inquiry was circulated among British hospitals by the BMA and produced substantially similar figures.[4]

After this period, among a multiplicity of authors, the period lengthens to "five to eight" weeks. Thus Matti in 1931 states, "Solid healing of fractures of the shafts of both leg bones takes five to eight weeks; it occurs more quickly the younger the patient and the better the position of the fragments. Transverse fractures heal more slowly than oblique, apparently because the callus-forming zone is less disturbed."[5] In 1938 Böhler states, "Fractures with little displacement heal in eight weeks, but with greater displacement take ten to twelve weeks."[6] This is the figure I obtained in uncomplicated cases in a fracture clinic before the war.

1. Malgaigne, J. F. Treatise on Fractures, Packard's Translation, 1858, p. 635.
2. Hamilton, F. H. Practical Treatise on Fractures and Dislocations, Philadelphia, 1860.
3. Heister, L. General System of Surgery, London, 1750, p. 106.
4. Bennett, W. H. *Brit. med. J.* 1900, ii.
5. Matti, H. Knochenbrüche, Berlin, 1931, p. 828.
6. Böhler, L. Die Behandlung der Frakturen, Vienna, 1938, vol. 2, p. 1194.

We are thus prompted to ask what has caused the delay from consolidation in six weeks to consolidation in eleven weeks, between 1840 and 1940? In my opinion it is chiefly due to the use of X rays for the diagnosis of union. If a series of cases is taken, and the time of clinical union tested against the time for radiological union, a period of five weeks will be found on the average to have elapsed. With the advent of X rays as a criterion of union (and this did not become of value or was generally employed till after 1920) we started to be more careful in letting our patients up, with apparent slowing in the rate of union. I think the first conclusion we must draw is that we should rely more on clinical evidence of consolidation. A second factor is undoubtedly the greater use of plaster; for, if the splint cannot be frequently removed to estimate union, it tends to stay on longer than necessary, and the average figures rise. I am not convinced that delay is any more than reflexion of these facts; in a recent small series of military cases of a similar type to Burns and Young's later group, I find union to have averaged eleven weeks.

The comparison of such statistics is however rendered rather valueless by a lack of agreement as to what constitutes a legitimate complication delaying union. Like Burns and Young, I have noted the delay when there was an accompanying fracture of the femur, but no mention was made in their paper of the effect of the double spiral, or double oblique fracture which separates a triangle of bone, and in my experience slows down the period of union by five to seven weeks. The importance of local skin infection, apart from actual infection of the bone, was not mentioned, and many cases nowadays have burns or abrasions together with their fracture. Nor is the statement "apposition approximately equal" a sufficient yardstick for comparison, as the displacement before reduction is surely, from this point of view, as important as the position after reduction, and may well determine when a plaster may be applied. In short, I feel that the rate of union of fractures has remained unaltered, and that if we are keeping our cases longer in hospital it is due to a higher incidence of complicated fractures—if we exclude maltreatment, and with Burns and Young I am in hearty agreement about the danger of overtraction and prolonged traction in causing delay.

As a last point it is interesting to note that the protagonists of absolute immobilisation are the protagonists of early walking plasters. I find it impossible to believe that any plaster, however skilfully applied, totally abolishes movement at the fracture site, and I think the case for slight movement at the fracture site hastening union, provided it does not produce a shearing strain, can be readily defended. Within the last few months I have found it necessary to remove several plasters for skin conditions, and leave them off till they were cleared up. I have been surprised in three of these cases to find the incomplete union rapidly become complete, instead of becoming increasingly unstable. Possibly others have had a similar experience.

Newmarket. J. GRANT BONNIN.

STAPHYLOCOCCAL NURSERY

SIR,—I am prompted by your leading article of Sept. 26 to record some hitherto unpublished observations of my own. During a 3 months' bacteriological survey of the nursery in a large London hospital I examined nasal swabs from 93 infants between five and seven days old: 90 (97%) were carriers of coagulase-positive staphylococci. This survey was undertaken during the period of heavy enemy air attacks in the winter of 1941 and the nursery was for this reason situated in the basement of the hospital. It was not understaffed or overcrowded but there was no direct ventilation. During the period under review there were amongst these 93 infants 22 cases of mild clinical infection, "sticky eyes" and skin lesions of various kinds, attributed to staphylococcal infection, these organisms being recovered in profuse culture from all the lesions examined. The staphylococci from the first five "sticky eyes" were examined by Dr. E. H. Gillespie and all were found to belong to Cowan's type 1. No attempt was made to type the staphylococci from the remaining cases. As a control to these observations (and through the kindness of Mr. Eardley Holland) I took nasal swabs from 32 infants in three emergency maternity homes situated in the country. Of these children, who were in a similar age-group to the London children, only 11 (34%) were found to be nasal carriers of coagulase-positive staphylococci. In none of these three homes had there been recent outbreaks of staphylococcal infection.

The number of children examined in the country homes is admittedly too small for the results to bear statistical analysis, but superficially there appears to be a marked discrepancy between the two groups, town and country. It seems possible that the high carrier-rate obtaining in the town group, which is in accord with the observations of other workers in this field, may have been associated with the local conditions under which the infants were living, the degree of dust pollution of the atmosphere and the prevalence of staphylococcal infections in their immediate environment. A staphylococcal outbreak certainly appeared to be in progress during the period of the survey.

One further observation made during this survey seems worthy of note. Swabs were taken from the eyelids of 45 normal infants in the London nursery: 25 (56%) yielded coagulase-positive staphylococci in profuse culture. In view of this high carrier-rate it seems that, in the absence of more conclusive evidence, the staphylococcal ætiology of "sticky eye" should be accepted with reserve. Where serological methods have established the identity of staphylococci from consecutive cases of pemphigus neonatorum [1] there seems less reason for doubting their causal relationship although even then the evidence is not conclusive. With the possible exception of the 5 cases mentioned above where type 1 staphylococci were recovered in profuse culture from 5 consecutive eye infections, the serological method of approach does not yet appear to have been applied to the epidemiology of "sticky eye."

London, W.6 S. D. ELLIOTT.

MEDICAL PLANNING

SIR,—Your report on the BMA representative meeting was illuminating. It seems hardly credible that the proposals to await the opinions of the men on service could be turned down and that so close a vote on the no income limit should be considered representative of the profession. Truly the spirit of totalitarianism seems abroad in the land. Certain members urged that the feelings of those who did not agree with group medicine and health centres should be disregarded, and that "one street one doctor" should be the rule. This is indeed a portent of our fate under even the semi-state service of the Planning Commission scheme. What mandate has the BMA to abolish private practice? Why forestall a hypothetical government-imposed scheme by running our own heads into the noose? At all costs let us preserve our freedom. Our patients prefer to see us in our own homes; when they need specialist services they can be referred to a hospital, often by appointment. The scheme is un-English and uproots the traditions of medical practice of which the new President speaks so highly.

Gloucester Gate, N.W.1. RUSSELL STEELE.

CONSIDERATE TONSILLECTOMY

SIR,—Mr. Gerrie and Dr. Ross Mackenzie are entitled to the last word, but I want to ask them one question: Do they agree with the ideals they mention, or do they use the word to suggest the unattainable? If the former, their hospital and its system must conform to what they believe to be the best for their little patients or become a picturesque backwater in the medicine of the past. If the latter, let them take courage, and they will find that ideals are attainable. These are not merely mine, they are developments from great teachers—Mr. F. J. Steward and Sir William Milligan. They have therefore stood the test of nearly 50 years and have the support of leaders of thought in our profession—of physicians, especially when they specialise in diseases of the chest; of administrators in the educational and public health services, and of general practitioners old enough to be seeing into the world children whose parents and grandparents they have saved from tonsillectomy without harm. To follow these ideals leads one to apply consideration to the indications for as well as to the technique of tonsillectomy. It was Mr.

1. Elliott, S. D., Gillespie, E. H. and Holland, E. *Lancet*, 1941, i, 169.

Steward who, when shutting down tonsil and adenoid operations for the winter, once said that one advantage of doing so was that by the spring you had learnt how many of them were unnecessary. Children's hospitals seem not to be conducive to the conservation of the subepithelial lymphatic glands; perhaps because those who work in them see their little patients for so short a period of their lives instead of from eight months to eighty years as others do; but anyone incurs a grave responsibility today who, unless the indications are overwhelming, advises the removal of this protective tissue before the child has withstood the increased droplet infection of the first few years of school life.

It is sad to relate that Professor Digby, who by his book *Immunity and Health* (1919) did more than anyone to impress this idea upon the profession, has not been heard of since the fall of Hong-Kong.

Guy's Hospital. T. B. LAYTON.

CERTIFICATION OF DEATH IN INFANCY

SIR,—I would like to make one or two observations on Dr. Miller's conclusions in his article of Sept. 5. Under existing conditions in private practice, when a doctor is unable to certify a cause of death he has to notify the coroner. The latter is merely concerned to know whether the death is due to unnatural causes and will often dispense with an autopsy if the facts of the case do not lead him to suspect foul play. Lay people often regard an inquest as carrying a stigma and the family doctor, out of regard to the family, is tempted to sign the death certificate on the flimsiest data. This state of affairs could be improved by increasing the facilities for post-mortems to be done at the practitioner's request by the provision of large well-equipped public mortuaries with a staff of competent pathologists. At the same time an attempt should be made by means of intelligent propaganda to overcome the prevalent lay prejudice against the necropsy. Further liaison between clinical pathological services and the practitioner would be an enormous advantage. There should be a staff of technicians to visit the sick baby's home for the purpose of taking blood-counts, blood-films, &c. at the practitioner's request. The doctor usually has neither the time nor the special experience required. Such facilities do exist but are not sufficiently comprehensive, and in many cases the cost is prohibitive. These two provisions would add enormously to our knowledge of pædiatrics, because the greater proportion of childhood ailments have to be treated by the private general practitioner who often has to struggle on without the tools of modern medicine.

Newcastle-on-Tyne. SIDNEY WOOLF.

INOPERABLE GASTRIC CANCER

SIR,—I was most interested to read Major Raven's review, in your issue of Sept. 19, of the results obtained by the treatment of inoperable carcinoma of the stomach by radon seed implantation. Out of five cases I have treated by a combination of gastrojejunostomy and radon implantation one case seems worth recording because of the remarkable improvement in general condition and prolongation of life beyond the usual expectancy. This patient was 58 years of age, with an inoperable pyloric carcinoma. Following the operation considerable improvement in health was apparent, although convalescence was at first somewhat delayed by wound infection. He put on nearly a stone in weight after leaving hospital and surprised me three months later by telling me that he had gone back to work. When he was seen fourteen months after his operation he was still doing light work and was without symptoms. At that time a barium meal showed the same original deformity at the pyloric end of the stomach.

Gidea Park. D. LANG STEVENSON.

ANÆMIA IN PREGNANCY

SIR,—Your leading article (Sept. 19, p. 337) brings together forcibly the present views of some workers upon the blood condition of antenatal cases. While macrocytic anæmias are comparatively rare the microcytic type appears to be increasing both in these women and in the community at large. The article suggests that iron in absorbable form should be widely provided, but states that the "fortified milk scheme" would be difficult to carry out. It would, however, be possible to fortify the bread (though previous discussions in the *Lancet* and the *British Medical Journal* make me hesitate to suggest any further modification of this essential food!). Fortification with iron phytate, sodium ferric pyrophosphate and ferrum redactum was, however, satisfactorily carried out in the United States before the war, so that the practicability of the method has been established (Council on Foods and Nutrition, *J. Amer. med. Ass.* 1941, **116**, 2849; *Ibid*, 1941, **117** 366). There appears to be some disagreement as to the efficacy of the iron compounds then used (Free, A. and Bing, F. *Nutrition*, 1940, **19**, 449; Widdowson, E. M. *Nature, Lond.* 1941, **148**, 219; Widdowson, E. M. and McCance, R. A. *Lancet*, 1942, i, 588), but further experimental work might well provide a more satisfactory form in which to introduce iron into bread. Critics may contend that everyone does not require extra iron, but these I would ask whether harm from increased iron intake has ever been proved, while to the large proportion of the population who are now iron deficient the effects would be extremely beneficial.

Farnborough, Kent. HELEN P. WRIGHT.

PLANNED NUTRITION

SIR,—The recent drive for the formation of a Nutrition Council, primarily planned for the benefit of the Ministry of Food, ignores the history of that ministry in its relations to scientific advisers. It is clearly futile to establish yet another advisory committee, no doubt with an expensive secretariat, personnel, officers, and so forth, unless there is some probability that its advice will be taken by the ministry for whom it is mainly provided. The history of the Ministry of Food in this respect gives little encouragement to this expectation. Experience of the past three years has in fact demonstrated that multiplication of committees has provided a convenient smoke-screen for ministries, behind which they pursue, undisturbed, policies often having no scientific sanction and principally dictated by the permanent staffs of individual departments.

House of Commons. E. GRAHAM-LITTLE.

ANÆSTHETIC MORTALITY

SIR,—I should like to support Dr. Rawdon Smith in stressing the imperative necessity of recording anæsthetic fatalities. I am afraid there can be no doubt that we have been grievously misled about the safety of some of the newer anæsthetic agents. During the past twenty years I have worked frequently at a number of suburban and provincial hospitals, where most of the anæsthetics are given by general practitioners, who use chloroform freely and openly. In all this time I have never seen a chloroform death and I have never heard of a chloroform death occurring at these hospitals. With spinal, intravenous and local anæsthesia, this is not the case. There have been in my own district a number of fatalities from these newer anæsthetic agents, not one of which has been reported in the medical press. We can only make an actuarial estimation of anæsthetic risks from a study of anæsthetic fatalities, and unless these fatalities are published we are completely at sea.

New Barnet. JOHN ELAM.

LIAISON

SIR,—While the difficulties in establishing liaison between the Civil Defence, the Home Guard, and the RAMC as outlined by Z. M. A. are no doubt true for many localities, it would be erroneous for your readers to suppose that they are true universally. Here in Ramsgate we have established at least the beginnings of satisfactory coöperation and have held exercises to try out our organisation. I will not claim that we have solved many of our problems, but at least we are beginning to see precisely what they are—which is the first essential step towards solving them. Your correspondent's difficulty with the Civil Defence authorities, when he was told that there was no order in the civil defence service touching the matter of liaison with the Home Guard, seems inexplicable; for there is in existence a Ministry of Health circular (No. 2486) dated Sept. 12, 1941, which deals with this matter. It is in fact, for a circular, reasonably clear and certainly provides the basis upon which a scheme may be built.

Ramsgate. J. V. WALKER,
Medical Officer of Health.

Obituary

HEDLEY DUNCAN WRIGHT

B A TASMANIA, M D, D SC EDIN, M R C P E

Hedley Wright came to this country from his native Tasmania in 1910, and while still an undergraduate at Edinburgh he went to Serbia as a dresser in the Scottish Red Cross unit during the second Balkan war. As soon as he graduated with first-class honours in 1916 he obtained a commission in the RAMC and served in France, India, Baluchistan and Persia before he returned to civilian life in 1920. Wright's career as a bacteriologist was started auspiciously under James Ritchie in his own university and continued, under A. G. McKendrick, as assistant superintendent of the research laboratory of the Royal College of Physicians of Edinburgh. By McKendrick he was initiated into the mysteries of statistical analysis as applied to biological problems, a discipline which was later to stand him in good stead, and he always spoke of that association as one of the happiest and most fruitful in his life. But it was as lecturer, and later reader, in bacteriology at University College Hospital medical school under A. E. Boycott that Wright really began to show his outstanding qualities as a bacteriologist. Here he carried out over a number of years his important investigations into the bacteriological and immunological aspects, clinical and experimental, of bacterial endocarditis, pneumococcal septicæmia, puerperal sepsis and other forms of bacteræmia. From these studies he was led to a reinvestigation of the subject of nutrient media, with particular reference to the production of an optimum medium for the cultivation of the pneumococcus and related organisms.

In 1930 Wright was appointed to the newly instituted chair of bacteriology in the University of Sydney, which he occupied with great distinction. With a big new teaching department to organise he had less time for original research, but he was able to continue his studies into the fundamental nutritional requirements of bacteria cultivated in vitro, and he set a fine standard of work for those who were to follow him. With his translation to Liverpool in 1934, new fields of inquiry presented themselves, particularly in relation to epidemiology and public health. His studies ranged over such practically important subjects as the bacteriology of water-supplies and of pasteurised milk, the laboratory diagnosis of diphtheria, cross-infection in diphtheria wards and the occurrence of diphtheria bacilli in ward dust. Most of these studies were made in collaboration with his colleagues Shone, Tucker, Glass and Holt. He also made fruitful use of an opportunity which presented itself to investigate an epidemic of paratyphoid fever, and he played a considerable part in the establishment of the Emergency Public Health Service. His last contribution, a note of warning as to the possibility of occurrence of diphtheria in inoculated persons, appeared only a month before his death.

He was a member of the bacteriological committee of the Medical Research Council and of its subcommittees on cross-infection in hospitals and on diphtheria immunisation. He was a fine committee man, wise, blunt in speech, a hard hitter, never allowing himself to be ruffled. He also sat on the research advisory committee of the Development Commission and of the University of London committee for making appointments to chairs and readerships in pathology, while in the senate of the University of Liverpool lay members of other faculties listened to his counsel and opinions with more appreciation than those of any other member of the faculty of medicine.

Wright has described himself as " a real cricket fan " and he had played first-class cricket both in Tasmania and in Edinburgh. At University College, in later years, he used often to be the far from forlorn hope of his side in the staff *v.* students' match.

During 1928–30 and again from 1937 until his death he had been an assistant editor of the *Journal of Pathology and Bacteriology* and Prof. Matthew Stewart, to whom we are indebted for much of the material for this memoir, writes: " He was an ideal editorial colleague, expeditious, business-like and constructively critical. His own writings were models of lucidity, and many are grateful for the help he gave them in the preparation of their papers for the press. An upright and fearless man, Wright was a fighter where he considered fighting necessary, and an indefatigable worker. Scholarly, thoughtful and philosophical, he had read widely in many branches of literature and he was a charming companion and good conversationalist. He had achieved much in his all too short life and he had made many good friends by whom he will be remembered as one of the truest and best."

Wright's end was clouded by tragedy. He had had a major operation in January, 1939, from which he made a good recovery, but towards the end of last year he began to go downhill. A second operation early this year gave him relief, but did not bring the hoped-for improvement in his general state. During the summer term he insisted on going down to his laboratory to give his usual lectures, though this greatly exhausted him, and his condition deteriorated rapidly. In July his wife, whose health had already given cause for anxiety, had a stroke of which she died a fortnight later. And after weeks of great physical distress borne with heroic fortitude Wright himself died on Sept. 9. Of their three sons the eldest has just taken his degree in chemistry at Liverpool, the second is serving in the Merchant Navy and the third in the Royal Navy.

ROBERT CECIL ROBERTSON

M C, M D GLASG, F R F P S, M R C P E, D P H

THE news of Cecil Robertson's death at Hong-Kong on Aug. 4 will come as a shock to his friends in this country. Robertson was not only a brilliant bacteriologist, but he was a born artist. With no instruction, save a few hints from his gifted wife, he painted pictures which were accepted by the Royal Academy. His was a robust personality, capable and versatile. As soon as he saw that a thing wanted doing he set to work and did it. His organising power was remarkable and his leadership inspiring. It was my good fortune to be one of his colleagues in the Henry Lester Institute of Medical Research, Shanghai, and I well remember his coming to my department and saying, " Here is the Yangtze out of hand, one of the greatest floods in history, what are we going to do about it ? " At once he took the lead. One of the Moller line steamers was chartered, partitions torn out, staircases put in and an oldish cargo boat transformed into a hospital ship.

Inspired by his drive and leadership, various Chinese and foreign members of the staff of the institute offered their services and within a matter of days he was on his way up the Yangtze to Hankow, combining an errand of mercy with a full-scale investigation of the ætiology and treatment of the diseases which develop side by side with flood conditions.

Most of Robertson's colleagues in the Henry Lester Institute were, of course, Chinese, and his devotion to them drew out a like devotion on their part to him, so that he developed a splendid team spirit in his division. One day in Shanghai he was taking a small Chinese boy, the son of one of his servants, in his car to have an inoculation when it was seized by armed gangsters. His chauffeur was bundled out and the car driven along one of the unfrequented roads on the outskirts of the settlement. Robertson realised that he and the boy were being kidnapped. Wrapping his great coat round the frightened Chinese boy and holding him snugly to himself, he quietly opened the door and rolled out. Before the miscreants could recover from their surprise he had picked up the boy and disappeared among the bushes, making his way to safety.

It was no cause for wonder to us who knew him that in August 1937, when Shanghai became involved in the Sino-Japanese war, Robertson at once offered his services to the municipal health department and organised a large part of its relief and refugee work, using the

opportunity to investigate deficiency diseases. Or that in 1939, when the League of Nations wanted a commissioner to take charge of the British anti-epidemic unit in China, they invited Robertson to take the lead. With his team of workers he made a splendid epidemiological survey of Southern and Western Yunnan.

To Robertson the need of the sick and suffering was always a call along two lines—to bring relief and to investigate the cause so as to prevent a recurrence. And now he has gone from us and the world is poorer for his passing. To his wife and daughter, who escaped from Shanghai just before the invasion, we tender our respectful sympathy. H. G. T.

Robertson, who was 52 years of age, graduated from the University of Glasgow in 1914, and for his service with the RAMC during the last war was awarded the MC. On his return he continued for a time to work in the vaccine department of the RAM college, before becoming assistant bacteriologist to the corporations of Bradford and Glasgow in turn. Later he was pathologist to the Ministry of Pensions Hospital at Bellahouston. Much of his work in China was done at the Lester Institute at Shanghai, and it was only in 1940 that he took up his chair in Hong-Kong.

HEINZ LOTHAR MEYERHOF

MD MILAN

Dr. Heinz Meyerhof died suddenly at Sherbrooke, Canada, at the early age of 27. Born in Berlin, he spent his youth there and began his medical studies in the university, but he left Germany in 1933 to continue his studies in Milan, where he graduated in 1938 with first-class honours in medicine and surgery. In Italy he supported himself entirely by means of commercial drawings. He undertook research work on the chemotherapy of spirochætosis in the Serological Institute at Milan, and later collaborated with Professor Zirconi in an investigation on the action of embryonic extracts on the sex organs. This work was published in the *Journal of Physiology* in 1940, and was followed by a short paper by Meyerhof himself on lymphocytosis induced by extracts from lymph nodes, a subject on which his MD thesis had been based.

Early in 1939 Meyerhof was forced to leave Italy, and he came to England to continue his investigations in the Department of Pathology in Cambridge, working with a grant from the Society for the Protection of Science and Learning. He was classified by a Home Office Tribunal in October, 1939, as a "refugee from Nazi oppression." In May, 1940, he was interned, being an alien resident in a protected area, but was released in January 1941, and went to Canada where his lectures in medicine and bacteriology were greatly appreciated. His sudden death ended a promising life. Meyerhof possessed a strong artistic vein; and those with whom he came into contact will remember him for the courage with which he cheerfully overcame the many difficulties encountered in his career and for his goodness of heart and happy comradeship.

FIRST-AID DIAGRAMS.—Messrs. Adam Rouilly & Co. have produced two new wall charts for first-aid instruction. One, roughly a yard square, shows 12 fractures, the other, about half that size, shows 4 dislocations. The original drawings are by W. J. Pardoe, made under the supervision of Professor Smout of Birmingham. The drawings are semi-diagrammatic, and contain no needless detail to confuse the student. They are, however, sufficiently pictorial to make the nature of the injuries clear to the back benches and somewhat exaggerated colour is used with effect.

NUTRITION SOCIETY.—A whole-day conference of this society will be held at the London School of Hygiene, Keppel Street, London, W.C.1, on Saturday, Oct. 17, at 11 AM, to discuss trace elements in relation to health. The chair will be taken at the morning session by Mr. J. Russell Greig, PH D, and at the afternoon session by Prof. C. R. Harington. Further details from the hon. secretary, Mr. Leslie Harris, D SC, Dunn Nutritional Laboratory, Cambridge.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Notes and News

MINIATURE MASS RADIOGRAPHY

AT a meeting of the Joint Tuberculosis Council held on Sept. 19 Dr. G. Jessel presented a careful report by the radiology committee which was adopted. During the discussion emphasis was laid by Dr. R. A. Young on the necessity for regarding X-ray examination as an integral part of medical examination as a whole; it was most undesirable that one negative radiogram should be regarded as proof of immunity from tuberculosis for all time. The council thought it impossible as yet to estimate with any degree of accuracy the number of beds which should be available for new cases discovered by mass investigation. There was some difference of opinion about who should interpret the small films, one of a panel of clinicians or a radiographer. Common ground was found in all the following propositions. Mass radiography should be treated as part of a general health survey and not related in the public mind specifically with tuberculosis. It would neither be desirable nor generally possible for mass radiography to be carried out at existing tuberculosis dispensaries, but tuberculosis officers should take an active part in reading the films and investigating the suspects. A central committee approved by the Ministry of Health with a medical advisor should be established to coördinate and supervise mass radiography. Sets should be lent to selected county and county borough councils after an approved scheme has been submitted by the medical officer of health and tuberculosis officer. They should be set up in centres convenient to large numbers of workpeople and moved to other premises from time to time for the examination of further batches. Groups for examination might include: (1) Government and local government staffs, civil defence personnel, post office employees, police, fire brigade, and so on; (2) Workers in munition works and other industries, particularly those known to provide an undue proportion of cases of tuberculosis; (3) Secondary school leavers. Special attention should be given to age-groups 16–30 years. The staff employed in mass radiography should receive some central training. The small films would be read by one of a panel of clinicians, including the local tuberculosis officer and radiologist. Suspicious films should lead to a full-size radiogram being taken. This, if suspicious, would in turn lead to a full investigation at the local tuberculosis dispensary or general hospital. Permission was given by the Council for the report to be used for propaganda purposes in the scheme about to be launched.

THE FRENCH AND BELGIAN WAY

THE Belgian review *Message* is still a young journal not yet out of its first year. Among English and French articles of general interest, the August issue contains an account[1] of the Centre de Rééducation at Finedon, Northants, where men leaving the Services are refitted to earn their livelihoods. The centre is sponsored and largely financed by General de Gaulle, but it is helped too by other friends and by numerous gifts and subscriptions. It differs strikingly from its English counterparts in being run jointly by an artist and a scientist, Joseph Lacasse, the artist, is a Belgian; Colonel Baranger is French. They are old friends and have worked together in France before the war, to provide work and opportunities for struggling artists. At Finedon Hall something of the freedom of an atelier has been created even on our unpromising British soil. Newcomers are not pressed to take up any special form of work; they wander round and see what is being done, try their hand at this or that, and gradually become absorbed by some art or trade, until they are working hard at it from choice. Thus a man who began as a carpenter is now one of the most promising artists in Lacasse's studio. Craftsmen can take up their old trades or try new ones. The care of the house is in the hands of the residents: they began by piping their own water-supply; they replace crumbling stone and are providing a summer room with window frames and glass against the English winter. Bricklayers and carpenters thus find work ready to their hand; blacksmiths and metal workers can use the forge, potters

1. Orchard, V. *Message*, August 1942, p 30.

and shoemakers find the materials of their craft waiting for them, a printing press is being installed, and fabrics are woven. In the Victorian-Gothic tower Colonel Baranger and his assistants have their laboratories, and some patients discover a liking for work at the bench or undertake care of the animals. Dress is according to taste, and everyone smokes anywhere he pleases. This wholesome lack of useless restrictions is something of a lesion for us, who still lurk in a cocoon of red tape.

LCC AND PREMEDICAL STUDY

THE Interdepartmental Committee on Medical Schools have asked the London County Council for their views on medical education. The only aspects of the subject which the council think directly concern them as a local education authority are the facilities available for medical students in their preregistration period and the scholarships and exhibitions which can be given to students who need help. The council are of the opinion that the proper place for the study of the preregistration subjects is the secondary school and not the medical school and that their study should be increased. The county scholarships and exhibitions are not limited in number and all students who secure the required academic qualification are eligible. The scholarships are tenable in London or in the Provinces, but there is evidence that London students, both men and women, are finding it difficult owing to the increased number of applications to obtain admission to medical schools in London. The council further state that any arrangements which they might make to further medical education would, of course, be open equally to both men and women, and they would expect to be treated financially by the Government not less favourably than the voluntary teaching hospitals and medical schools.

London Voluntary Hospitals

The 162 voluntary hospitals within metropolitan London have now 22,400 beds, where during 1941 over 1,300,000 patients were treated at a cost of over £4 million. These figures include the 1,214,000 outpatients who made over 5,500,000 attendances at the hospitals. The 39th annual statistical report of King Edward's Hospitals Fund for London, which has just been published, shows also that there were ample funds to meet the expenses of this service. Income was £4,299,000, or £216,485 more than was needed to balance the maintenance budget. In addition, £429,376 was received as free legacies, which brought the surplus up to £654,821. The report is limited to the hospitals operating within the metropolitan police area, and takes no account of beds provided and staffed by London voluntary hospitals outside this area under the Emergency Medical Service.

Royal Society of Medicine

During the coming week four presidential addresses will be given at this society. On Tuesday, Oct. 13, at 2.30 PM, at the section of psychiatry, Dr. John Brander will speak on medical and social implications of psychological medicine; on Oct. 14, at 4.30 PM, at the section of physical medicine, Dr. Philippe Bauwens will speak on physical medicine and planning for the future; on Oct. 15, at 4.30 PM, at the section of neurology, Dr. R. Mackenzie Stewart will speak on the pathology of cerebral diplegia; and on Oct. 16, at 4 PM, at the section of radiology Dr. F. M. Allchin will speak on radiography as the handmaiden of radiotherapy. On Oct. 16, at 3.30 PM, the section of obstetrics and gynæcology will also meet, when Prof. Dugald Baird and Prof. Charles McNeil will open a discussion on stillbirth and neonatal mortality.

Faculty of Radiologists

A meeting of the therapy section of the faculty will be held at 10 AM, on Saturday, Oct. 17, at 32, Welbeck Street, London, W.1, when Dr. F. Ellis, Mr. C. W. Wilson and Dr. J. L. Dobbie will open a discussion on beam direction in radiotherapy.

Association of Scientific Workers

On Sunday, Oct. 18, this association will hold a conference at Cardiff on science for victory. Speakers will include Dr. F. H. Tyrer and Dr. J. Greenwood Wilson. Further information may be had from the Conference Secretary, 130, Cardiff Road, Llandaff, Glam.

Infectious Disease in England and Wales

WEEK ENDED SEPT. 26

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1963; whooping-cough, 938; diphtheria, 807; paratyphoid, 13; typhoid, 9; measles (excluding rubella), 3356; pneumonia (primary or influenzal), 459; puerperal pyrexia, 161; cerebrospinal fever, 70; poliomyelitis, 32; polio-encephalitis, 7; encephalitis lethargica, 2; dysentery, 237; ophthalmia neonatorum, 112. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Sept. 23 was 1497, including scarlet fever, 415; diphtheria, 177; measles, 172; whooping-cough, 218; enteritis, 71; chicken-pox, 49; erysipelas, 37; mumps, 42; poliomyelitis, 7; dysentery, 29; cerebrospinal fever, 5; puerperal sepsis, 26; enteric fever, 12; german measles, 1; continued fever 6; other diseases (non-infectious), 125; not yet diagnosed, 95.

Deaths.—In 126 great towns there were no deaths from scarlet fever or the enteric fevers, 2 (0) from measles, 13 (2) from whooping-cough, 21 (0) from diphtheria, 70 (10) from diarrhœa and enteritis under two years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

Manchester reported 8 deaths from diarrhœa, Liverpool 7, no other great town more than 3.

The number of stillbirths notified during the week was 223 (corresponding to a rate of 36 per thousand total births), including 23 in London.

Births, Marriages and Deaths

BIRTHS

BELL TAWSE.—On Sept. 28, at Southborough, the wife of Dr. Alan Bell Tawse, RAFVR—a daughter.

CHAPMAN.—On Sept. 30, at Edenbridge, the wife of Surgeon Commander W. Rougier Chapman, RNVR—a daughter.

CRISP.—On Sept. 29, at Chorley, the wife of Captain W. J. C. Crisp, FRCS, RAMC—a son.

EDWARD.—On Sept. 28, at Cardiff, the wife of Dr. D. G. ff. Edward—a son.

HAMBLY.—On Sept. 28, at Seer Green, Bucks, to Dr. Elizabeth Hambly (née Cadbury), the wife of Mr. Edmund Hambly, FRCS—a son.

LOCK.—On Sept. 25, at Guildford, the wife of Surgeon Lieutenant J. A. N. Lock, RNVR—a son.

POLLARD.—On Sept. 26, in Oxford, the wife of Captain Graham Pollard, RAMC—a son.

WHEATLEY-LEVITT.—On Sept. 27, in Aberdeen, the wife of Surgeon Lieutenant C. Wheatley-Levitt, RNVR—a daughter.

WISE.—On Sept. 26, at Adlington Hall, Cheshire, the wife of Lieutenant Lionel Wise, RAMC—a daughter.

MARRIAGES

CALDWELL—DEAKIN.—On Sept. 29, at Ewell, Surrey, David Laurie Caldwell, MRCP, to Ann Gillian Deakin.

HICKINBOTHAM—CADBURY.—On Sept. 26, at Birmingham, Paul Frederick John Hickinbotham, FRCS, lieutenant RAMC, to Catherine Rachel Cadbury.

LAMBERT—PLEDGER.—On Sept. 26, at Easthampstead, John Lambert, MD, of Wellington College, to Vera V. Pledger, of Peterborough.

PINNIGER—PRATT.—On Sept. 8, at Hoyland, Yorks, John Lawrence Pinniger, MRCP, to Katharine Mary Pratt.

SCHOTT—LOEWI.—On Sept. 28, in London, Adolf Schott, MD, of Harley Street, to Erica Loewi.

DEATHS

ANDREW.—On Sept. 27, at Hendon, Francis William Andrew, MRCS, aged 75.

BATEMAN.—On Sept. 25, at Bexhill-on-Sea, Charles Edward Gooderson Bateman, LRCPE, aged 79.

CARR.—On Sept. 29, John Walter Carr, CBE, MD LOND, FRCP, FRCS, aged 80.

DIGGLE.—On Sept. 30, at Dunham Massey, Cheshire, Frank Holt Diggle, OBE, MB MANC, FRCS.

EWART.—On Oct. 2, at Weybridge, George Arthur Ewart, BA CAMB, FRCS, aged 56.

GEORGE.—On Sept. 26, at Paignton, Richard Julyan George, MD EDIN, DPH.

KIDD.—On Oct. 2, Leonard Kidd, MD DUBL, DL, of Enniskillen, aged 79.

MOORE.—On Sept. 27, at Cheltenham, Robert Reginald Heber Moore, CBE, MD DUBL, late colonel RAMC, aged 83.

PECK.—On Sept. 27, at Bourne End, Bucks, Eric Finch Peck, MRCS.

ROBERTSON.—On Aug. 4, in Hong-Kong, Robert Cecil Robertson, MC, MD GLASG, FRFPS, MRCPE, D PH, professor of bacteriology and pathology, aged 52.

The Index and title-page to THE LANCET, Vol. I, 1942, which was completed with the issue of June 27, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

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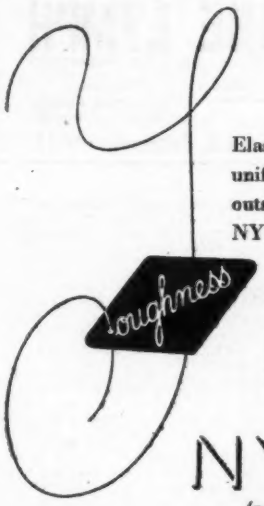

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Child Guidance Council.
FELLOWSHIPS IN PSYCHIATRY.
Applications are invited for Fellowships in Child Psychiatry, tenable at various training Centres and probably becoming vacant during the next six months.
Fellowships are of the value of £150 tenable for one year for half-time work and candidates should hold the Diploma in Psychological Medicine or show evidence of psychiatric knowledge up to a similar standard. Experience in pediatrics or the School Medical Service will be regarded as an asset.
One Fellowship is tenable at the Oxford Child Guidance Training Centre, and the successful candidate for this will be expected to start work during November, 1942.
All applications for Fellowships coming available during the next six months should be made now to the Medical Director, Child Guidance Council, 79, Buckingham Palace Road, London, S.W.1, not later than October 24th, and should be accompanied by not more than three recent testimonials.

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WAR SURGERY OF THE ABDOMEN
19th–23rd October, 1942

Monday, 19th Oct.	10 A.M.	Introduction	Sir James Walton, K.C.V.O., F.R.C.S. F.A.C.S.
	11.15 A.M.	Types of Abdominal Wounds and their Consequences.	Sir James Walton, K.C.V.O., F.R.C.S., F.A.C.S.
	12.15 P.M.	Pre-operative and Post-operative Treatment of Abdominal Wounds.	Mr. R. H. Franklin, F.R.C.S.
	2 P.M.	Shock	Dr. J. McMichael, M.D., F.R.C.P., F.R.S.E.
Tuesday, 20th Oct.	10 A.M.	Injuries of the Kidney and Ureter, including Gunshot Wounds.	Mr. John Everidge, O.B.E., F.R.C.S.
	11.15 A.M.	The Bladder in War Injuries.	Mr. John Everidge, O.B.E., F.R.C.S.
	2 P.M.	Immersion Blast Injuries..	Surg. Commander Rex Williams, M.B., B.S., R.N.
Wednesday, 21st Oct.	10 A.M.	Gunshot Wounds of Rectum and Large Bowel.	
	11.15 A.M.	Wounds of Solid Viscera ..	Prof. G. Grey Turner, F.R.C.S.
	12.30 P.M.	X-ray Demonstration ..	Major Duncan White, M.B., Ch.B., D.M.R.E., R.A.M.C.
	2 P.M.	Immediate Complications of Abdominal Wounds.	Surg. Commander Frank Stabler, M.D., F.R.C.S.
	3 P.M.	Some Late Complications and Sequelæ.	Surg. Commander Frank Stabler, M.D., F.R.C.S.
Thursday, 22nd Oct.	10 A.M.	Gunshot Wounds in the Field.	Lieut.-Colonel d'Abreu, F.R.C.S.
	11.15 A.M.	Technique of Operations for Abdominal Wounds.	Lieut.-Colonel d'Abreu, F.R.C.S.
	2 P.M.	Gunshot Wounds of Urethra.	Mr. Clifford Morson, O.B.E., F.R.C.S.
	3.15 P.M.	Gunshot Wounds of External Genitalia.	Mr. Clifford Morson, O.B.E., F.R.C.S.
Friday, 23rd Oct.	10 A.M.	Abdomino-thoracic Wounds	Mr R. C. Brock, M.D., F.R.C.S.
	11.15 A.M.	Fæcal Fistulæ, etc., following Abdominal Wounds.	Mr. A. L. Abel, M.S., F.R.C.S.
	12.30 P.M.	Anæsthesia	Dr. Woodfield Davies, L.M.S.S.A.
	2 P.M.	Multiple Injuries with Abdominal Wounds.	Lieut.-Colonel d'Abreu, F.R.C.S.

The fee for the Course will be one guinea, but no fee will be charged in the case of Officers of the Armed Forces who are nominated for the course by their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.

Further War Courses will commence as follows:—

WAR MEDICINE COURSE	2ND NOVEMBER, 1942.
TREATMENT OF FRACTURES (limited to 40) ..	16TH NOVEMBER, 1942.
WAR SURGERY OF THE CHEST	30TH NOVEMBER, 1942.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, November 9th, December 7th, 1942, January 11th, 1943; MEDICINE, November 16th, December 14th, 1942, January 18th, 1943; MIDWIFERY, November 17th, December 15th, 1942, January 19th, 1943.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

Royal College of Surgeons of England,

Lincoln's Inn-fields, London, W.C.2.

NOTICE OF ANNUAL MEETING OF FELLOWS AND MEMBERS.

Notice is hereby given that it is proposed to hold a Meeting of Fellows and Members at the College in Lincoln's Inn-fields on THURSDAY, 19TH NOVEMBER, 1942, at 2.30 P.M., and that a Report from the Council will be laid before the Meeting. Fellows and Members can obtain copies of the Report on application to the Secretary, and can, if they so desire, have their names placed on the list of those to whom the Report is sent annually. Motions to be brought forward at the Meeting must be signed by the mover, or by the mover and other Fellows and Members, and must be received by the Secretary not later than the 9th November. A copy of the Agenda will be issued on or after the 14th November to any Fellow or Member who may apply for one.

10th October, 1942. KENNEDY CASSELS, Secretary.

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MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

SHAFTESBURY HOUSE

FORMBY-BY-THE-SEA
Nr. LIVERPOOL

Specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen suffering from NERVOUS and MENTAL breakdown. Voluntary and certified patients received. Ladies also admitted as Temporary Patients without certification. Terms moderate. *Apply*, RESIDENT PHYSICIAN, who may be seen in Liverpool, by appointment. *Tel. No.* 8 *Formby.*

ROYAL EARLSWOOD INSTITUTION

REDHILL, SURREY

For MENTAL DEFECTIVES of all ages

Training under medical supervision. Schools, Farm, Trade Workshops, Recreations. Fees £125 to £375 p.a. Election by votes of subscribers at reduced terms for necessitous trainable cases.

Apply, Secretary. Tel.: Redhill 344.

SPRINGFIELD HOUSE

'Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)

MAGHULL, Near LIVERPOOL

Open Air Occupation and Recreation for Patients, Farming, Gardening, Football, Cricket, Tennis, Bowls, etc. School recognised by Board of Education.

FEES—1st Class (men only) .. .. from £3 per week
2nd Class (men and women) .. .. „ 37/6 „
3rd Class (men and women) supported by—
Public Assistance Committees .. .. „ 27/6 „
Education Committees .. .. .. „ 33/6 „
Private .. .. „ 21/- „

For further particulars apply to—
C. EDGAR GRIENWOOD, A.C.A., 36, Exchange Street East, LIVERPOOL. 2

CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

THE COPPICE, NOTTINGHAM

HOSPITAL FOR MENTAL DISEASES

President: The Right Hon. LORD BELPER

REGISTERED HOSPITAL for Voluntary, Temporary, or Certified PRIVATE PATIENTS of UPPER and MIDDLE CLASSES. Own kitchen garden. Modern forms of treatment, including Electro-shock Therapy. Out-door games, cinema visits, motor drives arranged. Visiting Chaplain.

For terms, &c., apply to: Dr. G. M. WODDIS, Medical Superintendent. Telephone: 64117 Nottingham.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

Bolingbroke Hospital Incorporated,

Wandsworth Common, S.W.11.

The Board of Governors invite applications for the post of TEMPORARY HONORARY PHYSICIAN. Candidates must be Fellows or Members of the Royal College of Physicians engaged only in consulting practice.

Applications, stating age, qualifications, experience, &c., accompanied by copies of recent testimonials, should be sent as soon as possible to—

W. S. RANDOLPH BIBS, Secretary-Superintendent.

South London Hospital for Women,

Clapham Common, S.W.4.

Applications are invited from registered Female medical practitioners for the appointment of GYNÆCOLOGICAL REGISTRAR (Part-time). Candidates should hold the diploma of F.R.C.S. or M.R.C.O.G. Salary according to experience and time available.

Applications, stating age, nationality, qualifications with dates, and accompanied by copies of three recent testimonials, should be sent to the SECRETARY at the Hospital by Saturday, 17th October.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages)

sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6818.)

Elizabeth Garrett Anderson Hospital.

(1) At the ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1.

Applications are invited from registered medical Women practitioners for the appointment of a RESIDENT SURGICAL OFFICER (B2), vacant on 1st November. The appointment will be for a period of six months. The salary is at the rate of £200 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41, may also apply.

(2) At OSTER HOUSE M.S. HOSPITAL, ST. ALBANS.

Applications are invited from registered medical Women practitioners for the appointment of Two HOUSE SURGEONS (A), vacant on 1st November. The appointments will be for a period of six months. Salary is at the rate of £100 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications for all the above appointments, with two copies of each of three testimonials, should be sent to the SECRETARY of the Elizabeth Garrett Anderson Hospital by 17th October.

London County Council.

TEMPORARY ASSISTANT DISTRICT MEDICAL OFFICERS required for—

(*a*) AREA I, DISTRICT I (part of the Borough of Poplar). Provisional salary £240 a year.

(*b*) AREA VII, DISTRICT N (part of the Borough of Wandsworth). Provisional salary £205 a year.

Persons engaged required to carry out duties prescribed by Public Assistance Order, 1930, and to reside in or near district. Remuneration and conditions subject to review.

The vacancy in Area VII, District N, exists during the absence on war service of the appointed district medical officer.

Application form obtainable (stamped addressed foolscap envelope necessary) from the MEDICAL OFFICER OF HEALTH, London County Council, Staff Division (S.D.2), The County Hall, S.E.1, returnable by 19th October, 1942. Canvassing disqualifies.

London Jewish Hospital,

Stepney Green, E.1.

Applications, stating age, qualifications with dates, and nationality, are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT HOUSE OFFICER (A) (combined duties of House Physician, House Surgeon, and Casualty Officer), vacant on 1st November, 1942. Salary at the rate of £100 per annum, plus a proportion of a grant received in connexion with the E.M.S., with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months; otherwise it will be for at least six months.

The Royal Dental Hospital of London,

32, Leicester-square, W.C.2.

Applications are invited from dental surgeons who also hold medical qualifications for the appointment of MEDICAL REGISTRAR, vacant on the 1st January, 1943. The appointment is for one year with a maximum period of three years (subject to National Service requirements). Salary £500, rising to £600 per annum. Private practice not permitted.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent not later than Monday, the 2nd November, to—

W. J. ICKERINGILL, Secretary-Superintendent.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of Two HOUSE PHYSICIANS (A), vacant on the 1st November, 1942. The appointment is for six months. The salary is at the rate of £105 per annum, plus full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications, together with copies of three recent testimonials, should be made to the DEAN, British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.12, not later than Tuesday, 20th October, 1942.

Dreadnought Seamen's Hospital,

Greenwich, S.E.10.

Applications are invited from British Male registered medical practitioners for the appointment of HOUSE PHYSICIAN (B2), now vacant. Salary at the rate of £120–£200 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41, but rejected by the R.A.M.C., may also apply when appointment will be limited to six months.

Applications, stating age, qualifications with dates, and accompanied by copies of three recent testimonials, to be sent to: F. A. LYON, Secretary.

Seamen's Hospital Society, Greenwich, S.E.10.

The Middlesex Hospital, W.1.

Applications are invited for the B1 posts of:—

(*a*) SENIOR ASSISTANT RADIOTHERAPIST,

(*b*) JUNIOR ASSISTANT RADIOTHERAPIST,

in the MEYERSTEIN INSTITUTE OF RADIOTHERAPY.

The salary of the Senior post will be according to experience, with a minimum of £600 per annum, non-resident. The commencing salary of the Junior post will be £350 per annum, non-resident. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Applications, with copies of testimonials, should be submitted to the SECRETARY-SUPERINTENDENT by Saturday, 17th October, 1942.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) (Woman) required for REDHILL COUNTY HOSPITAL, Edgware, Middlesex. Applicants must be registered medical practitioners with considerable obstetric experience. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time obstetric duties in maternity department (60 beds); also work at Middlesex County Maternity Hospital, Bushey Heath (50 Beds), and such other duties as the Council may direct, under supervision of Medical Superintendent and Obstetric Surgeons. Appointment for four years only, subject to medical examination and one month's notice. Post now vacant.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, to the undersigned. Application forms not provided. Relationship to any member or officer of Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 17th October, 1942.

C. W. RADCLIFFE (B3), Clerk of the County Council.

Middlesex Guildhall, Westminster, S.W.1.

Middlesex County Council.

RESIDENT OBSTETRIC HOUSE SURGEON (B2) required for NORTH MIDDLESEX COUNTY HOSPITAL, Edmonton, N.18. Applications invited from registered medical practitioners. R practitioners qualified more than three months ineligible unless rejected by R.A.M.C. Salary £120 p.a. plus cost-of-living bonus. Board, lodging and laundry. Appointment is for six months, subject to medical examination and one month's notice. Whole-time duties, such as Council may require, under direction of Medical Superintendent. Hospital has a large obstetric and gynæcological department and is approved for R.C.O.G. purposes. Post vacant 1st November, 1942.

Application, stating age, nationality, qualifications with dates and experience, to Medical Superintendent "B3" of hospital. Application forms not provided. Relationship to any member or officer of Council to be disclosed. Copies of not more than three recent testimonials. Canvassing directly or indirectly will disqualify. Closing date, 17th October, 1942.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, Westminster, S.W.1.

County Borough of Hastings.

TEMPORARY DEPUTY AND ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER.

Applications are invited from duly qualified medical practitioners for the above appointment, at a salary of £650 to £700 per annum, according to experience. A car will be provided, or alternatively an allowance for the use of car will be made. In addition to other duties, the officer appointed will assist in connexion with A.R.P. casualty services, and such other duties as may be assigned by the Medical Officer of Health to the officer appointed.

Further particulars, together with forms of application, can be obtained from the undersigned. Application under cover, endorsed "Temporary Deputy Medical Officer," to be delivered at my office, "Summer Fields," Bohemia-road, St. Leonards, not later than Monday, the 26th October, 1942. Canvassing will be a disqualification.

D. W. JACKSON, Town Clerk.

Summer Fields, Town Hall, Hastings.

Burton-on-Trent General Infirmary.

Applications are invited from registered medical practitioners (Male) for the appointment of CASUALTY OFFICER AND HOUSE PHYSICIAN (A). Salary at the rate of £150 per annum, with usual emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to—

E. W. THORNLEY, Superintendent and Secretary.

Coventry and Warwickshire Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the following appointments vacant on 1st November:

SENIOR CASUALTY OFFICER (B2) and HOUSE SURGEON (B2). Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months.

HOUSE PHYSICIAN (A). Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Salary for each appointment is at the rate of £150 per annum, plus £20 cost-of-living bonus, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

S. CECIL HILL, House Governor and Secretary.

Broadmoor Criminal Lunatic Asylum,

CROWTHORNE, BERKS.

Applications are invited for the post of TEMPORARY JUNIOR MEDICAL OFFICER (B1), now vacant, at the above Institution, from registered medical practitioners (Male), including those at present holding B1 appointments, provided that the permission of their present employing authorities is given. Salary is at the rate of £525 per annum, with furnished quarters and attendance, but not board. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Applications, stating age, nationality, and qualifications, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL SUPERINTENDENT as soon as possible.

Children's Hospital, Nottingham.

Applications are invited for the post of RESIDENT HOUSE SURGEON (B1) (Woman). The salary will be at the rate of £220 per annum, with apartments, board, and laundry. The appointment will be for six months, duties to commence on the 1st December, 1942.

Applications, together with testimonials, stating age, nationality, qualifications, and experience, to be sent to the HONORARY SECRETARY, 1, King John's-chambers, Bridlesmith Gate, Nottingham, on or before Tuesday, 20th October, 1942. Selected candidates will be required to attend at the Hospital for a personal interview.

Glasgow Royal Infirmary.

Applications are invited from registered medical practitioners for the post of ASSISTANT RADIOLOGIST (full time). Salary £500 per annum.

Full particulars may be obtained from the Superintendent, Glasgow Royal Infirmary, 84, Castle-street, Glasgow, C.4.

Applications, stating age, qualifications, and experience, with copies of three recent testimonials, should be sent not later than 24th October, 1942, to the SECRETARY, Glasgow Royal Infirmary, 135, Buchanan-street, Glasgow, C.1. No canvassing.

Preston and County of Lancaster

ROYAL INFIRMARY.

Applications are invited from registered medical practitioners (Male or Female), preferably those possessing the Diploma in Anæsthetics, for the post of RESIDENT ANÆSTHETIST (B2), vacant on the 31st October. Salary at the rate of £300, with the usual residential allowances. Practitioners qualified more han three months and liable under the National Service Acts,o t1939–41 (males must be rejected by the R.A.M.C.), may als apply when appointment will be limited to six months.

Applications, stating age, qualifications, and experience, together with copies of three testimonials, should be forwarded to: JOHN GIBSON, Superintendent and Secretary.

The Lawn, Lincoln.

(Registered Hospital for Mental and Nervous Diseases.)

Applications are invited from registered medical practitioners, Male and Female, for an ASSISTANT MEDICAL OFFICER (B2), one with previous mental hospital experience preferred. Salary £300 per annum, with emoluments and war bonus. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months. Electric Convulsion Therapy is in use.

Apply THE CHAIRMAN OF GOVERNORS, The Lawn, Lincoln.

Royal Infirmary, Sunderland.

(236 Beds in active use.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of CASUALTY OFFICER and HOUSE SURGEON (A) to the EAR, NOSE and THROAT DEPARTMENT, vacant almost immediately. The appointment will be for a period of 6 months. The salary is at the rate of £150 per annum with full residential emoluments. The post is recognised under the regulations for the D.L.O. Practitioners within three months of qualification and liable under the National Service Acts 1939–41, may also apply.

Applications, stating age, nationality, qualifications and accompanied by copies of testimonials to:—

M. J. HUNTLEY, House Governor and Secretary.

County Borough of Reading.

BATTLE HOSPITAL. (608 Beds.)

RESIDENT ASSISTANT MEDICAL OFFICER (B2) required for general duties, mainly surgical and gynæcological. Salary at the rate of £300 per annum, with full residential emoluments for a single person. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months; otherwise it is renewable but not to exceed twelve months.

Applications, on forms obtainable from the undersigned, are returnable with copies of three recent testimonials not later than the first post on 26th October, 1942.

C. S. JOHNSON, Town Clerk.

Town Hall, Reading, October, 1942.

Manchester Victoria Memorial Jewish

HOSPITAL (Non-sectarian) (102 Beds),
Elizabeth-street, CHEETHAM.

Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE SURGEON (B1). Applicants should have held house appointments and had surgical experience. Salary is at the rate of £225 per annum. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent not later than 18th October, 1942, to—

C. D. DRAKE, General Superintendent.

Royal Berkshire Hospital, Reading.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), vacant 1st November. Salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent immediately to—

H. E. RYAN, Secretary and House Governor.

Taunton and Somerset Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), vacant at the end of October. Salary is at the rate of £175 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply. Appointment will be for six months.

Applications to be sent to the SECRETARY.

Rugby Hospital.

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment. Applicants should have held house appointments and had surgical experience. The salary is at the rate of £300 per annum, together with full residential emoluments. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply. The appointment is limited to twelve months.

Forms of application can be obtained from the Public Assistance Officer, Shire Hall, Warwick, and should be returned to him with copies of not more than three recent testimonials not later than Friday, the 23rd October, 1942.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 3rd October, 1942.

The Chester Royal Infirmary.

(Normal Capacity, 225 Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of HOUSE PHYSICIAN (A) from 1st November. The appointment is for six months and is approved in connexion with the M.D. (London) examination. Salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than the 22nd October, 1942, to Dr. W. H. GRACE, Honorary Secretary, Medical Committee.

3rd October, 1942.

Salford Royal Hospital.

(256 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) to SPECIAL DEPARTMENTS. Salary at the rate of £150 per annum, with full residential emoluments. The appointment is normally for six months. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications on the prescribed form should be sent immediately to the undersigned, from whom further particulars and form of application are obtainable.

H. B. SHELSWELL, General Superintendent and Secretary.

October, 1942.

Borough of Macclesfield.

Applications are invited for the appointment of TEMPORARY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER at a commencing salary of £800 per annum, rising by annual increments of £25 to a maximum of £900 per annum (plus Whitley Council cost-of-living bonus), with a car allowance of £60 per annum. The person appointed will be required to devote the whole of his time to the duties of the office and will be responsible for the public health work in the Borough, including maternity and child welfare, school medical services, and the Council's Isolation Hospital. He will also be required to act as certifying officer under the Council's Superannuation Scheme. Applicants must be registered medical practitioners holding a diploma in sanitary science, public health, or State medicine, and should have had experience of the administrative work of a Public Health Department. The appointment will be subject to the provisions of the Sanitary Officers (Outside London) Regulations, 1935, and to the approval of the Minister of Health.

Applications, stating age, qualifications, and full particulars of previous experience, accompanied by copies of recent testimonials, and endorsed "Medical Officer of Health," must be delivered to the undersigned not later than Saturday, 24th October, 1942.

Canvassing will be a disqualification.

ARTHUR BOND, Town Clerk.

Town Hall, Macclesfield, 1st October, 1942.

County Borough of Middlesbrough.

HEALTH DEPARTMENT.

HOLGATE MUNICIPAL HOSPITAL.

Applications are invited for the appointment of ASSISTANT RESIDENT MEDICAL OFFICER (B2) from unmarried Male registered practitioners. The salary is at the rate of £270 per annum, together with full residential emoluments. Candidates should have had recent hospital experience. In addition to hospital duties, the successful candidate will be required to undertake relief or holiday duty of other whole-time members of the Corporation medical staff. The Municipal Hospital contains 353 Beds and is a training school for nurses. The appointment is subject to the rules and regulations of the Middlesbrough Corporation, and the successful candidate will be required to pass satisfactorily a medical examination. Practitioners qualified more than three months, liable under the National Service Acts, 1939–41, and rejected by the R.A.M.C. may also apply when appointment will be limited to six months; otherwise not exceeding twelve months.

Applications, stating age, qualifications, nationality, and particulars of present appointment and experience, accompanied by copies of three recent testimonials, to be sent to the Medical Officer of Health, Municipal Buildings, Middlesbrough, not later than 12th October, 1942.

26th September, 1942. PRESTON KITCHEN, Town Clerk.

County Borough of Warrington.

BOROUGH GENERAL HOSPITAL. (300 Beds.)

Applications are invited from registered medical practitioners for the post of RESIDENT MEDICAL OFFICER (B2). Salary £225 per annum, together with board, residence, and laundry. There are two other Medical Officers in residence; good opportunity for experience in midwifery and surgery. Candidates must be single, fully qualified, and registered. Appointment for six months. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply.

Applications, stating age, qualifications, and experience, and date available to commence duties, together with copies of not less than three testimonials, to be sent not later than Tuesday, 20th October, 1942, to—

STUART F. ALLISON,
Medical Officer of Health and Medical Superintendent of Corporation Hospitals.

Health Department, Warrington, October, 1942.

The Staffordshire General Infirmary,

STAFFORD.

Applications are invited from registered medical practitioners Male and Female, for the appointment of a HOUSE PHYSICIAN (A), to commence duties 26th October. The appointment will be for six months. Salary £175 per annum, with board-residence. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications, stating age, qualifications, and experience, accompanied by copies of three recent testimonials, should be sent forthwith to: A. E. COLLINS, Secretary.

Stafford, 3rd October, 1942.

Bristol Royal Hospital.

(Incorporating the BRISTOL ROYAL INFIRMARY and the BRISTOL GENERAL HOSPITAL.)

Applications are invited for the post of TEMPORARY ACTING MEDICAL REGISTRAR (B1). Salary up to £400 per annum, according to experience and qualifications. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Candidates, who must be registered medical practitioners, should send in their applications to—

ELLIS C. SMITH, F.C.I.S., Secretary and House Governor.

Bristol Royal Infirmary.

City of Bradford.

MUNICIPAL GENERAL HOSPITAL, ST. LUKE'S.

APPOINTMENT OF OBSTETRIC HOUSE SURGEONS (B2).

Applications are invited from registered medical practitioners, Male or Female, for the above posts. Salary £200 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months; otherwise not exceeding twelve months.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of testimonials, must be received by the Medical Officer of Health, Town Hall, Bradford, not later than the 19th October, 1942.

N. L. FLEMING, Town Clerk.

Town Hall, Bradford, 1st October, 1942.

Surrey County Council.

PUBLIC ASSISTANCE DEPARTMENT.

RICHMOND P.A. INSTITUTION. (350 Beds.)
(Including GROVE ROAD HOSPITAL. (180 Beds.))

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT ASSISTANT MEDICAL OFFICER (B1), tenable for the further duration of the war and subject to one month's notice on either side. In addition to the medical treatment of Surrey civilian sick, the Medical Officer will take part in the clinical work of the Emergency Medical Scheme section of the Hospital. Experience in midwifery is desirable. Salary at a point on the scale £350–£25–£450 per annum, according to experience, plus full residential emoluments. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Applications to the COUNTY MEDICAL OFFICER, County Hall, Kingston-upon-Thames, by 20th October, 1942.

Norwich City Council.

WOODLANDS HOSPITAL. (311 Beds.)

Applications are invited from registered medical practitioners (Male or Female) for the appointment of ASSISTANT RESIDENT MEDICAL OFFICER (B2), vacant on the 1st December, 1942. The salary is at the rate of £250 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be for six months; otherwise will be renewable for a further period of six months, subject to satisfactory service.

Further particulars of appointment to be obtained from the SENIOR MEDICAL OFFICER, Woodlands Hospital, Bowthorpe-road, Norwich, and to whom applications should be sent.

County Infirmary, Cambridge.

Immediate applications are invited for the appointment of a HOUSE SURGEON (A) (Male or Female) at the County Infirmary, Cambridge, a public assistance institution up-graded as a Class I Hospital. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may apply when appointment will be for six months; otherwise for twelve months. The total number of beds available is 262; about 200 beds are occupied at the present time. Salary at the rate of £120 per annum, with board, residence, and laundry.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent at once to the CLERK of the Cambridgeshire County Council, Shire Hall, Castle Hill, Cambridge.

Shire Hall, Cambridge, 30th September, 1942.

Walsall General Hospital.

(181 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), vacant on 31st October, 1942. Salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be forwarded not later than Tuesday, 20th October, 1942, to: R. C. MILLWARD, House Governor.

Coventry and Warwickshire Hospital.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL REGISTRAR (B1), vacant immediately. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Salary is at the rate of £500 per annum, together with full residential emoluments. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the HOUSE GOVERNOR AND SECRETARY, Coventry and Warwickshire Hospital, Coventry.

City and County of Newcastle upon TYNE.

NEWCASTLE GENERAL HOSPITAL.

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners, Male and Female, for the above A posts vacant shortly. The appointments are tenable for a period of six months, and the salary is at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Surrey County Council.

REDHILL COUNTY HOSPITAL (General Hospital of 450 Beds), EARLSWOOD COMMON, REDHILL.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT ANÆSTHETIST (B1). The post is tenable for the further duration of the war and is subject to one month's notice on each side. Salary is at the rate of £550 per annum, plus full residential emoluments. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Apply to the MEDICAL SUPERINTENDENT.

The Bolton Royal Infirmary.

(245 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for appointment of HOUSE SURGEON (A) mainly in charge of Gynæcological and Ear, Nose and Throat Departments. Salary £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply, when appointment will be for six months.

Applications, stating age, nationality and experience, together with copies of testimonials, to be forwarded to the undersigned immediately.

JOSEPH GRIFFITH, Superintendent Secretary.

Huddersfield Royal Infirmary.

(321 Beds.)

HOUSE SURGEON (A) required to commence duty in October, 1942. Salary £150 per annum, with board, residence, and laundry. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may apply when appointment will be for six months; otherwise subject to renewal for a similar period for six months.

Applications, stating age, nationality, qualifications, and accompanied by copies of testimonials, to—

H. J. JOHNSON, General Superintendent and Secretary.

The Royal Hospital, Wolverhampton.

(Incorporated under Royal Charter.) (310 Beds.)

Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (A). Duties to commence forthwith. Salary at the rate of £100 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

24th September, 1942. W. H. HARPER, House Governor.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

CASUALTY OFFICER (A).

HOUSE SURGEON (A).

The appointments will be for six months. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply for the above posts.

ORTHOPÆDIC HOUSE SURGEON (B2).

Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months; otherwise not exceeding twelve months.

The salary of each of the appointments is at the rate of £175 per annum, with full residential emoluments.

This large industrial area offers excellent opportunities for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent immediately to—

R. LANCASTER, Secretary-Superintendent.

County Borough of Barrow-in-Furness.

Applications are invited from registered medical practitioners possessing a higher degree in obstetrics and gynæcology for the temporary post of JOINT OBSTETRIC OFFICER for the County Borough of Barrow-in-Furness and part of the Administrative County of Lancashire. Candidates must not be liable for military service. The salary will be at the rate of £1000 per annum, with travelling expenses for the county area in accordance with the County Council's scale. The appointment will be subject to the successful candidate satisfactorily passing a medical examination, and may be terminated by one month's notice in writing on either side.

Forms of application, particulars of duties, and terms of appointment may be obtained from the Medical Officer of Health, Town Hall, Barrow-in-Furness, and applications endorsed "Obstetrical Officer," with copies of not more than three recent testimonials, must be received by the undersigned not later than Tuesday, 13th October, 1942.

Canvassing, directly or indirectly, will disqualify.

LAWRENCE ALLEN, Town Clerk.

Town Hall, Barrow-in-Furness.

The Children's Hospital, Sheffield

(INC.) (157 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) vacant 1st October, including practitioners within three months of qualification and liable under the National Service Acts 1939–41, when the appointment will be for a period of six months. Salary is at the rate of £100 per annum with full residential emoluments.

Applications, stating age, nationality, qualifications, and accompanied by copies of three recent testimonials should be sent to the undersigned.

The successful applicant must be a member of a Medical Defence Society.

T. H. G. GARTLAND, Superintendent and Secretary.

County Borough of Southampton.

APPOINTMENT OF ASSISTANT SCHOOL DENTIST.

Applications are invited from Dental Surgeons (Male or Female) for the above appointment. The successful candidate will be required to pass a medical examination, and to contribute to the Local Government and Other Officers' Superannuation Scheme. Salary £500 per annum.

Form of application may be obtained from the undersigned, to whom it should be returned, together with copies of three recent testimonials, as early as possible.

H. C. MAURICE WILLIAMS, Medical Officer of Health.

Civic Centre, Southampton, 16th September, 1942.

The Medical Defence Union

Established 1885

President: JAMES FENTON, C.B.E., M.D., M.R.C.P., D.P.H.

Telephone: MUSeum 1337

Annual Subscription £1

MEMBERSHIP EXCEEDS 25,000

Entrance Fee 10s.
Assets exceed £100,000

No entrance fee to those joining within twelve months of registration.

Each member is provided with UNLIMITED INDEMNITY (subject to the Articles of Association) against Damages and Costs awarded in any case undertaken by the Council on his behalf.

A single subscription for members wholly retired from practice.

Special facilities for the protection of the estate of a deceased member.

Full particulars from Secretary (Dr. ROBERT FORBES), The Medical Defence Union, Ltd., 49 Bedford Square, London, W.C.1.

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Horton General Hospital, Banbury.
(220 Beds.)

Applications are invited from registered medical practitioners for the appointment of Two RESIDENT HOUSE SURGEONS. One B2 post for which practitioners qualified more than three months and liable under the National Service Acts 1939-41 (males must be rejected by the R.A.M.C.), may also apply, when appointment will be limited to six months. One A post for which practitioners within three months of qualification and liable under the National Service Acts 1939-41 may also apply, when appointment will be for six months. Salary at the rate of £150 per annum.

Applications to RICHARD H. PRESCOTT, House Governor.

Victoria Hospital, Burnley.
(169 Beds.)

Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE SURGEON (A), vacant on 18th October, 1942. Salary at the rate of £150 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months; otherwise it may be extended.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

J. E. WHEATCROFT, Secretary.

Rotherham Hospital.

Applications are invited from registered medical practitioners (Male) for the appointment of a SECOND CASUALTY OFFICER AND HOUSE SURGEON (A) to the OPHTHALMIC AND E.N.T. DEPARTMENTS, vacant now. Salary £200 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply when appointment will be for six months.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to: T. H. FLETCHER, Secretary-Superintendent.

Rhondda Urban District Council.

Applications are invited from registered medical practitioners of either sex for appointment as ASSISTANT MEDICAL OFFICER, under the supervision of the Council's Medical Officer of Health and School Medical Officer, at a salary of £500, rising by annual increments of £25 to £700 per annum, plus the prevailing war bonus.

Forms of application and conditions of appointment may be obtained from the Medical Officer of Health, Tydfil House, Pentre, Rhondda, by whom completed applications must be received not later than Tuesday, the 20th October, 1942.

D. J. JONES, Clerk of the Council.

York County Hospital.
(222 Beds.)

Applications are invited from registered medical practitioners for the appointment of an ORTHOPÆDIC HOUSE SURGEON AND CASUALTY OFFICER (B2), vacant 1st November, 1942. Salary is at the rate of £175 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 14th October, 1942, to—

J. R. MACKRILL, Secretary.

Salisbury General Infirmary.
(Voluntary Hospital—365 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (B2), vacant on 19th October, 1942. The salary is at the rate of £125 per annum, with full residential emoluments. Practitioners qualified more than three months and liable under the National Service Acts, 1939–41 (males must be rejected by the R.A.M.C.), may also apply when appointment will be limited to six months.

Applications, stating age, nationality, qualifications, and accompanied by copies of testimonials, to—

JOHN WILLIAMS, Superintendent and Secretary.

East Suffolk and Ipswich Hospital.
(400 Beds.)

Applications are invited from registered medical practitioners for the appointments of HOUSE PHYSICIAN (A), and HOUSE SURGEON (A) to E.N.T. AND EYE DEPARTMENTS. Appointments will be for periods of three months. Salary is at the rate of £144 per annum, with full residential emoluments. Practitioners within three months of qualification and liable under the National Service Acts, 1939–41, may also apply.

Applications, stating age, nationality, qualifications, and accompanied by copies of testimonials, to—

ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 3rd October, 1942.

Applications are invited for the post of
OUT-PATIENTS' MEDICAL OFFICER. Successful candidates will be required to undertake morning work in the Out-patient Department. Applicants must be registered medical practitioners and possess a good knowledge of refraction work. Salary £200 per annum, six mornings per week.

Applications, giving qualifications and age, accompanied by three recent testimonials, should be sent to the GENERAL SUPERINTENDENT, MANCHESTER ROYAL EYE HOSPITAL.

Dr. Barnardo's Homes: National
INCORPORATION ASSOCIATION.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of an ASSISTANT RESIDENT MEDICAL OFFICER (B1) to the Hospital (100 Beds) and Reception Centre, Woodford Bridge, Essex. Applicants should have held house appointments and had experience of children's diseases. Salary is at the rate of from £350 to £400, according to previous experience. R practitioners holding A or B2 posts and rejected by the R.A.M.C. may also apply.

Full particulars may be obtained from the CHIEF MEDICAL OFFICER, 18/26, Stepney-causeway, E.1.

Ministry of Labour and National
SERVICE.
APPOINTMENT OF ONE OR MORE TEMPORARY MEDICAL INSPECTORS OF FACTORIES.

Applications are invited for the above appointments from registered medical practitioners who, in the case of Males, must be above the current registration age under the National Service (Armed Forces) Act or ineligible for service in H.M. Forces. Salary at a fixed rate of £750 per annum. Successful applicants will be required to reside in such places in Great Britain as the Minister may from time to time direct.

Further information, together with a form of application, can be obtained on request, preferably by postcard, from the FACTORY AND WELFARE DEPARTMENT (Room 6), 28, Broadway, Westminster, S.W.1.

New Zealand.

Applications are invited from duly qualified and registered medical practitioners holding a recognised Diploma in Public Health for appointment as MEDICAL OFFICERS OF HEALTH. These appointments can be regarded as a contribution to the war effort. Salary £1000 per annum (New Zealand currency).

For further particulars apply to the HIGH COMMISSIONER FOR NEW ZEALAND, 415, Strand, London, W.C.2, by whom applications will be received up to and including 31st October, 1942.

Griffiths' Medical Agency,
30, Bridge-street, NEWPORT, MONMOUTHSHIRE.

Telephone: 3994/5. Telegrams: "Ubique, Newport."

We have the following PRACTICES for Sale:—

MONMOUTHSHIRE.—Town Practice, £900 p.a., panel 1000. Good house to rent. Premium £1000.

NORTH WALES.—Practice, £1000 p.a., panel 1100. Good house, rent £50 p.a. Premium £1250.

GLAMORGAN.—Town Practice, £1500 p.a., panel 1200. Good town house, rent £86 p.a. Premium £2500.

GLAMORGAN.—Colliery Practice, £2000 p.a., panel 1400. Good house for sale, £775. Premium £2800.

The premiums on the above could be arranged on "easy terms."

Before the war the incomes of the first three Practices were 25 to 50 per cent. higher.

Send us your requirements. We have Practices to suit all tastes.

Reliable Locums required, 12 guineas a week.

Established Partnership for Sale, North
Lincs town. Share producing approx. £1450. Good panel. Semi-detached house to rent. Good scope.—Write, A. SHAW, Medical Transfer Agency, Premier Buildings, 88, Church-street, Liverpool, 1.

Midlands.—Wanted by experienced
ineligible practitioner, easily-worked MIXED PRACTICE, panel from about 1000 upwards, income £1000–£1500. Immediate cash.—Address, No. 928, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted, Electrocardiograph, second-
hand or for hire. N.W. London.—Address, No. 927, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted, preferably in Doctor's or
Dentist's house (West End), modern furnished BED-SITTING ROOM, h. and c.—C/o ELFVERSON & CO., LTD., 8–9, Carlisle-street, W.1.

Private Home for Early Mental
ILLNESS, ideally situated on the Helford River, receives a limited number of patients for care and active treatment. Special department for Insulin Therapy.—Illustrated brochure from RESIDENT PHYSICIAN, Trenython, Mawnan Smith, Cornwall. Telephone: Mawnan Smith 276.

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J. C. GILBERT LTD., Columbia House, Aldwych, W.C.2.
Tel.: Chancery 6060.

A new approach to the treatment of peptic ulcer

The endonasal application of specially prepared posterior pituitary, in powder form, has provided an interesting development in the medical treatment of peptic ulcer. Reports so far published, from both English and American sources, indicate the important position which this new treatment promises to occupy.

The treatment consists of a course of twenty-eight powders—Pituitary Powders (Spicer)—one of which is used as a snuff night and morning for fourteen consecutive days. Apart from the specific effect (American workers report improvement of varying degrees in 88 per cent. of their cases), gains in weight, strength and appetite are usual. The percentage of recurrences is small.

A pamphlet dealing fully with the treatment is available and will be gladly sent to interested physicians.

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(SPICER)

Boxes of 28 powders, 28/-

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